News Magazine of the American Standards Association, Incorporated

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Veneer Assn

Company Members—More than 2000 companies hold membership either directly or by group arrangement through their respective trade associations.

Marginal Notes

Comments from Abroad—

One individual's reaction to the international meetings held in New York in June (see report in STDZN, September 1952) was published in an Italian magazine in July. The delegate who signed the article is an important citizen not only in his native Italy but also in the new organizations charged with the responsibility for bringing about greater economic coordination in Europe. He was amazed at many things that Americans take for granted. There was the "self-washable" nylon shirt, for example. "Alas," he sighs, "my practical and provident spouse has filled my suitcase with dozens of articles which I must carry with me on my travels and which I must take to a laundry, for whose services I must pay a goodly sum." With the "self-washable" shirt he visualizes the possibility of traveling more comfortably and easily, with lighter luggage and less of it.

Americans who are used to labor-saving equipment and machinery—and even labor-saving clothing—find it difficult to realize that those in other parts of the world are not as fortunate. As this delegate comments, "Standardization in the United States has become such a natural and vital factor that it is no longer discussed. Its practical results are evident to everyone by the economic and social benefits it brings."

Many in Europe believe that life in the United States must be dull and monotonous because of the broad application of standardization, he comments. "But," he says, "only those who have never crossed the Atlantic can believe such nonsense. It is only necessary to look at the people in the streets, and at the articles produced by the conveyor system, in order to realize that in spite of such thorough standardization and mechanization, Americans preserve their individuality; each manages to look different even in a crowd."

Two things this delegate found to be expensive in the United States—shoeshines and haircuts. "But, of course, this is due to the fact that they are not yet standardized!"

Another International Note

It is a pleasure to announce in this issue, "This Month's Standards Personality," (page 343) that an old friend of standardization, Dr H. S. Osborne, has been highly honored, having been elected president of the International Electrotechnical Commission.

The National Standardization Conference

As this issue goes to press, a large part of the staff of the American Standards Association is on its way back from Chicago after attending the National Standardization Conference. This year the Conference was held September 8-10 in connection with the Centennial of Engineering. A report of the meetings will be published in a future issue.

OUR FRONT COVER

Through this long distance switchboard, any place in the United States or overseas that connects with the Bell System can be reached. Answering the customer's call, the outward operator notes details of the call on a toll ticket, then attempts to complete the call while the customer remains on the line. Standardization of the size and grade of paper used in these toll tickets has saved more than $80,000 annually. This is only one of the many savings mentioned by Kenneth B. Clarke, assistant superintendent of manufacturing engineering, Western Electric Company, in his article on page 332.

Opinions expressed by authors in STANDARDIZATION *are not necessarily those of the American Standards Association.*

Standardization

Formerly Industrial Standardization

ASA

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Published Monthly by American Standards Association, Incorporated

70 E. 45th St., N. Y. 17, N. Y. President: Roger E. Gay

Editor: Ruth E. Mason Production Editor: Marie Varlenger

OCTOBER, 1952 **VOL. 23, NO. 10**

Featured

Western Electric's Service with Standards. *By Kenneth B. Clarke* 332

NFPA Releases Proposed Electrical Code Changes... 339

How the States Stand on Rubber Mill Safety 340

The U.S. Chamber of Commerce Publishes Its Policy on Standards 342

Thirty-Seventh National Conference on Weights and Measures 342

This Month's Standards Personality 343

A-B-C Conference Report 344

A British Service View of A-B-C Standardization ... 345

Book Reviews 352

News

Terminology Standard a "Must" in Audiology Field. 343

Standards From Other Countries 349

Navy Asks Help in Simplifying Electronics Equipment 352

NPA Issues "Production Aid" Pamphlets 354

Standard Methods of Sampling Coal and Oil 356

International Work on Illumination 357

News Briefs 358

Obituary—Arthur L. Abbott 359

American Standards Activities

American Standards (Status as of September 22)... 353

What's New on American Standard Projects 355

Standardization is dynamic, not static. It means not to stand still, but to move forward together.

Single copy 35¢. $4.00 per year (foreign $5.00). Schools and libraries $3.00 (foreign $4.00). This publication is indexed in the Engineering Index and the Industrial Arts Index. Re-entered as second class matter Jan. 11, 1949, at the P.O., New York, N. Y., under the Act of March 3, 1879.

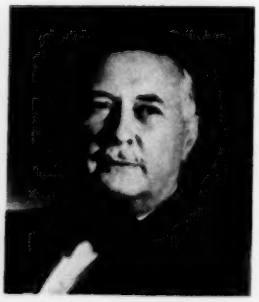
you hear the "voice with a smile" through

WESTERN ELECTRIC'S

LEGEND

- ■ MANUFACTURING PLANTS
- ● DISTRIBUTING HOUSES
- ▲ PRINCIPAL INSTALLATION OFFICES

Western Electric's standards, used in manufacturing plants, distributing houses, and installation offices in all parts of the country have made it possible to cut costs with increased efficiency.



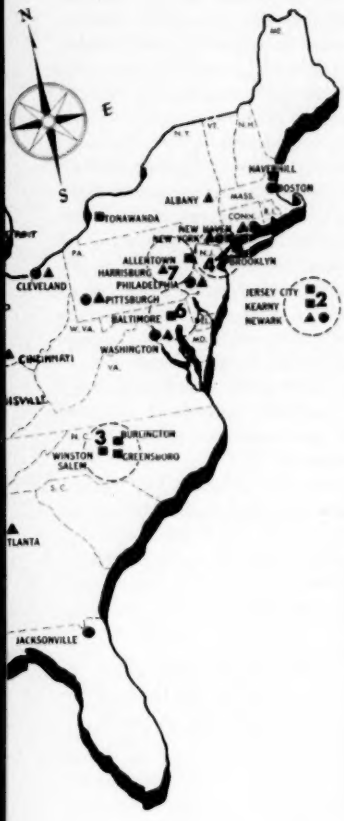
Kenneth B. Clarke, *author of this article, "Western Electric's Service with Standards," is assistant superintendent of manufacturing engineering, Western Electric Company, Inc, with headquarters in New York. Mr Clarke is responsible for the coordination of engineering activities throughout the 16 diversified plants of the Company.*

Born in Schenectady, N. Y., on June 28, 1902, he attended Union College, graduating in 1923 with a B.S. in civil engineering. Part of his school expenses were defrayed by part-time work with the General Electric Company, and the Stromberg-Carlson Telephone Company.

Mr Clarke joined the Bell System after graduation and was assigned to the student engineering course at Hawthorne Works, Chicago. After

SERVICE WITH STANDARDS

by Kenneth B. Clarke



successive engineering assignments (and a two-year "stretch" in Public Relations) he was named to his present position in 1946.

He was elected chairman of the Company Member Conference of ASA on September 8, 1952, and he is an alternate member of ASA's Mechanical Standards Committee and the Electronic Tubes Committee of NEMA.

FEW industries, during the history of their growth, have faced so great a need for applying the basic concepts of standardization as has the nation's complex telephone system. The reliability and efficiency of such a system, of necessity, must be dependent upon the effective operation of each interrelated part.

Recognition of this premise was evidenced in the early days of the Western Electric Company when it undertook the task of developing and manufacturing standardized telephones and telephone equipment for the Bell Company. So firm was the Company's conviction of the soundness of this premise that not only were the manufacturing processes standardized but uniformity of administrative practices, also, was instituted by President Enos M. Barton with his Executive Orders of the 1880's.

The success of these early practices is well known but even they have been improved and extended until today there are few of the materials and operations required in the production of Bell System telephone equipment that are not covered by standards or specifications. Volumes of instructions have also been published covering the administrative practices required in the conduct of the business.

In periods of inflated economy, such as today, the effectiveness of a continuing standardization program becomes even more apparent. The Western Electric program is one of the factors enabling the Bell System to furnish telephone service at prices which have risen less rapidly and steeply than the costs of the labor and materials required to provide that service.

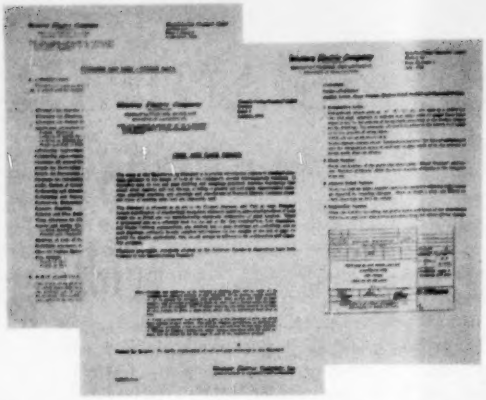
Administrative Standards

Basic requirements of administration in the Western Electric Company are established for each of the seven divisions of the Company and issued as Division instructions. Copies are supplied to the other divisions. Each division analyzes the instructions received and incorporates them, in so far as they are applicable to its own functions, into its Division instructions. This plan makes uniform methods for conducting the business available to the entire Company personnel spread over the United States—in the 15 manufacturing locations, 28 distributing houses, and 1,200 locations of installation crews, some permanent, some temporary, in telephone central offices across the country. Without such standard uniformity it would be very costly, if not impracticable, to supply to and install for the Bell System the equipment required to provide this country's present high quality, low cost communication system, unequalled anywhere else in the world.

Handbooks

Practically all of Western Electric's manufacturing standards are included in a series of Handbooks used at all manufacturing locations and available to any other interested organizations.

General manufacturing data are furnished to drafting, engineering, tool design, operating, and inspection groups at all plants and are a valuable engineering and shop reference. Among other things, these standards were created to eliminate frequent repetition of standardized information, both Company and national, on telephone apparatus drawings. They provide tabulated data on many items such as screw threads, general use fastening devices, abbreviations, precious metal contacts used in millions of relays, cast alloy mixtures, wood-



Western Electric's manufacturing standards, included in a series of handbooks, follow American Standards, wherever practicable.

working joints, and torque values for the hundreds of millions of screws used in manufacturing.

Standardization of engineering and drafting practices for telephone central office equipment has been accomplished through the Equipment Engineering Handbook. This prescribes standard procedures to be followed in all phases of equipment engineering, including drawings and specifications for manufacture of standard units of equipment and application on customers' orders. It not only serves Western Electric Engineering Departments at two plants but also serves the Installation Division as well as telephone company engineers in preparation and interpretation of specifications and drawings for installation and maintenance of equipment in telephone central offices over the country.

Piece Parts

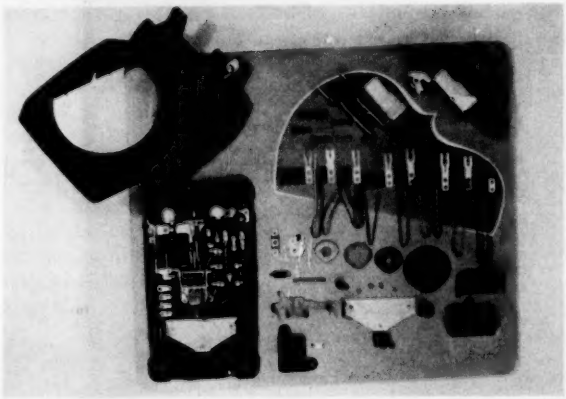
Over one billion commonly used piece parts are manufactured annually to take care of the volume of telephone products required by the Bell System. In this field, considerable standardization work has resulted in eliminating "specials" that have crept in during the past 20 years. Through this effort, an estimated saving of over $200,000 has been realized. This applies particularly to screws, nuts, washers, rivets, etc, which formerly required approximately 12,000 piece parts. Through standardization of materials, finishes, and sizes these have been reduced to about 8,000 piece parts.

The use of American Standard thread sizes was introduced about 10 years ago and, except for a few special and isolated cases, has progressed to 100 percent completion since that time. It is conservatively estimated that an over-all saving amounting to 20 percent of the total cost of all screws used has resulted from this single standardization. In addition, suppliers have been able to cut their delivery intervals by as much as 75 percent.

For years there was no standardization among the various military services in regard to plated finishes for corrosion protection. Commercial screws had no allowance for the specified thickness of plate so it was not even possible to stock these and plate as required. Further, the various military groups specified different kinds of finish and the inspection agencies would not permit use of screws purchased against an Air Force contract on a Navy contract and vice versa. As a result all screws had to be ordered in special individual lots at an average cost of $5.61 per gross as against a charge of 51 cents per gross if purchased in stock quantities of 15,000 or larger.

With the issuance of a standard military specification, AN-P-32, cov-

The newest design of telephone (the 500 type) and the parts that go into it.



ering zinc plate, it was possible to secure agreement of the various inspection agencies to permit stocking of screws to be applied on all contracts. In the first full year of operation the standard screw storeroom handled 6,700 disbursements at an average size of three gross valued at $1.53 each against a cost of $16.83 each when purchased under the old plan. Thus the savings may be computed at $15.30 per disbursement or approximately $100,000 annually. There also was a drop of up to 1,000 in the number of purchase requisitions issued with a concomitant decrease in purchasing costs.

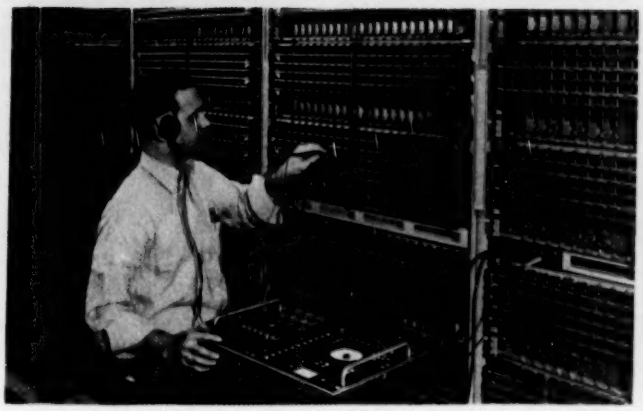
Standardization of machine screw heads and lengths greatly facilitated the manufacture of parts and simplified our manufacturing as well as outside procurement problems. Many "specials" were eliminated and savings effected in stocking and handling of such parts. For example, a study made some years ago disclosed that of the then 300 million screws used annually (now 600 million) about 42 million were special with attendant higher costs. Under standardization, we were able to change 39 million of them to national standards, thereby effecting a substantial saving.

Through standardization, the piece parts covering hexagon nuts were reduced from a total of 650 to 550 and rivets and escutcheon pins from 550 to about 300. Standards for lock washers reduced the number of piece parts 50 percent to a total of 125. A substantial reduction was also made in the piece parts of plain washers employed. We now use about 650 different piece part plain washers having a variety of finishes. Before standardization, nearly one thousand plain washers were listed for general use. By standardizing on 38 basic sizes, we were able to drop about 350 piece parts from the total parts then on record.

Tools

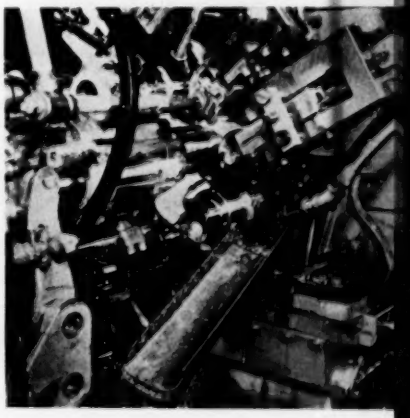
Considerable effort has been devoted to tool standardization work. and American Standards in this field are used wherever possible. The resulting standards, including shortcuts and improved techniques, have greatly increased efficiency in both tool design and tool building. Taking all factors into consideration, it is estimated that through Company activities in standards for tools and gages, since 1929 over fifteen million dollars have been saved because of interplant standardization in this field.

A universal electrode holder used on our bench welders in the production of vacuum tubes is a good illustration of benefits obtained from our own standardization. The holder is sufficiently flexible to meet virtually all small welding conditions and obviates the variety of special electrodes which formerly were handmade for each specific operation. This resulted in an established saving of $32,000 per year at the 1944 business level. The current high level of production multiplies the savings several times.



An installer is here checking the link frame of a crossbar, basic telephonic switching device for dial systems in central offices.

Machine below turns out the small brass barrel in which governor weights of the dial rotate in the new 500-type telephone set. Barrel is produced to high degree of accuracy in six operations—rough drilling, rough counterboring and forming, finish reaming, drilling of a small hole, reaming, and cutting. A barrel rolls down the raceway every four seconds.



Plant Engineering

It is our practice in the plant construction engineering organization to incorporate standard specifications issued by national organizations in our own specifications by merely making reference to the pertinent portion or code. We thereby save much time and effort in the preparation of our own construction specifications. Similarly, on drawings it is possible to make reference to the standard codes to define type of workmanship and material by a small note.

Drawings and Drafting Practices

Over 600,000 piece part drawings and about 45,000 apparatus design, assembly, and stock list drawings are used in the manufacture of the huge volume of currently active telephone apparatus required by the Bell Telephone System.

A great deal of attention has been given apparatus drafting and associated standardization during the past 20 years. During this period, it is estimated that savings of over 5 million dollars have been realized because of these efforts.

Due to standardization of drawing sizes and formats, eleven tracing sizes have been adopted for use by the Western Electric Company replacing 36 sizes formerly used.

More than 14,000,000 prints per year are required in the manufacture and installation of telephones and associated equipment. The use of Vandyke negative copies of the tracings to make this number of prints has saved wear and tear of tracings. This results in a reduction in manual drafting effort and also reduces the costs of making reproduced tracings.

Standardized symbols, tables, figures, etc were introduced for use on tracings and drawings. The standardized conventions were printed on translucent papers and applied as "paste-ons" on tracings. Typewriters were also utilized in drafting work for letter tracings along with the use of standard reproduction machines and other miscellaneous standard office equipment.

In order to expedite drafting, standardized form drawings have been prepared for the various types of tools, omitting dimensions and other dissimilar features. These forms are stocked and are used by the designer, who merely adds to the already partially completed drawing the specifications which are peculiar to the tool or gage he is designing. Through use of these form drawings, drafting time has been reduced as much as 50 percent to 75 percent.

Rubber stamps for placing recurring notes on drawings as well as templates for tracing outlines which very often appear on drawings have been provided.

Materials and Supplies

A great many standards of our own, as well as American Standards and standards of the national engineering and industrial societies, commercial and Government issues, are utilized in our procurement both of materials and supplies for our own use, and of the great variety and quantity of items required by the Bell System companies for whom Western is the purchasing and distribution agent.

At a dial switchboard—standardized methods and expert training give you speedy service.

A recent example of standardization of our own is the procurement of paint conforming to our formulation which was formerly purchased in accordance with a commercial specification. The cost under the formulation standard is $2.50 per gallon as compared to $3.50 per gallon when purchased to the commercial specification, resulting in a 30 percent direct saving.

Confusion arising out of trade nomenclature and definitions is avoided in the case of textiles such as those used in wire coverings where precise definition of terms and clear statements of required physical properties do much to expedite service.

Paper, Stationery and Printed Forms

As early as 1911 a suggestion was made to establish a Central Stationery Committee for the Bell System to consider anticipated advantages and proposed methods of operation in the standardization of paper items and the printed form contracts.

In 1917 and 1918 the AT&T Company made a survey of Bell System paper grades. Subsequently, samples of various grades, weights, and colors were obtained from the paper mills and were carefully screened with the result that tentative standards were decided upon which considerably reduced the number of grades and weights and limited the number of colors used in the System.

Between 1920 and 1922 paper specifications, based on test data accumulated on actual deliveries of the contract papers, the physical requirements of commercial equivalent papers, and Federal specifications including those of the Government Printing Office, were prepared and, subsequently, approved by our contract suppliers. The standardization of Bell System papers and centralized purchasing brought about a larger tonnage volume of fewer grades, weights, and colors which caused our business to be sufficiently attractive to warrant direct mill purchases with the ensuing estimated saving of 37.3 percent.

In September, 1922, arrangements had been made with the mills to supply unprinted typewriter papers (cut sheets, punched and unpunched). These papers theretofore had been supplied as a special service by the form printers who cut them from the larger (printer) sizes, punched as ordered, ream wrapped and shipped to the telephone companies or distributing house stocks. This change also developed an estimated saving of approximately 30 percent.

Standardization of Western Electric Company clerical paper stocks resulted in a reduction of the kinds of paper used from 129 to 56 and a reduction in colors from 19 to 9. Included in this study was the determination of the kind of paper which should be used to meet use and retention requirements. The annual savings estimated at the time of the study were $29,000.

Approximately 90 percent of our present planograph requirements are printed on the No. 4 sulphite bond paper which our suppliers consider their standard sheet for all customers. This high percentage of standardization was achieved through working closely with the ordering locations over a period of years. Worthwhile price savings have thus been realized as evidenced by the

fact that the prices for work printed on standard sulphite bond range from 20 percent to 70 percent lower than the prices for work printed on special papers. We estimate that on our present annual volume our standardization practices have saved us at least $500,000 a year.

In more recent years, as the result of extensive studies, it was possible to standardize the size of AT&T Company toll tickets and adopt only two grades of paper for this item. Having accomplished this standardization, it was possible for our main supplier of toll tickets to re-engineer his plant and install new web-fed rotary press equipment. This action over the five-year period commencing in 1948 will result in annual savings of over $80,000.

Standardization of sizes makes possible purchase of directories on a nationwide basis, saves at least 3 million dollars a year.

Studies were undertaken as far back as 1911 in the interest of standardizing printed forms and reducing the number of items used throughout the Bell System. The contract method of purchasing printing for associated companies was started in 1918 and by 1922 contracts were in effect for all companies. As the result of a thorough survey in 1924, considerable centralization of printed form purchases was made possible, at which time the number of sizes, as well as the grades and weights of paper, was reduced to a minimum. During the next seven years, our printed form contracts were converted to the square inch method of computing prices. We estimate that this over-all program of standardization resulted in a savings on our present annual volume of approximately $1,300,000 a year.

Savings through the standardization of types of envelopes and methods of ordering were estimated at $25,000 annually. One hundred twenty-nine types and sizes of envelopes were reduced to 46. A contract was set up for ordering three times per year, with a service organization combining locational requirements and entering one order. The price was based on the total quantity of each kind plus a very nominal charge for each imprint change. A miscellaneous order plan was devised to care for emergency requirements between regular periods.

Among its various functions, a central methods organization has been instrumental in minimizing the possible expansion of the number of local stationery forms at various operating locations. Savings estimated to be from 1½ to 2 million dollars have accrued over the years.

Office Equipment and Supplies

The adoption of the 60 x 30 in. and 45 x 30 in. desks instead of desks of 34 in. depth as standard for the Western Electric Company is calculated to result in a current saving in space of about 35,000 square feet, which at today's office rentals represents a considerable annual saving. In addition, it has permitted saving in building construction through modular type layouts. It also permits at minimum cost the ready transfer of equipment between locations for incorporation in the layouts of the new locations.

The adoption of five-drawer cabinets instead of four-drawer cabinets has resulted in savings in the purchase of equipment to date of $14,000 and 8,500 square feet of floor space. Further savings are possible as the replacement program develops.

Extensive system applications of punched-card equipment, bookkeeping machines, offset duplicating, and other special office equipments during the past 20 years have provided considerable savings. Correspondingly, this advantage has also been obtained from office machines and equipments in general use, such as typewriters, general calculating machines, etc. These introductions have provided economies in methods engineering, personnel training, machine maintenance, purchasing and clerical operations, as derived from their standardization aspects. While the exact amount of savings is difficult to establish for the extensive field of use at the various Company locations, estimates ranging from 1 to 2 million dollars would not seem unreasonable.

An over-all saving of over $500,000 has resulted over a period of years because of use of standard office supplies, such as "Owl" clips, mucilage, elimination of certain erasers, and also from standardization of correspondence setups. Estimated annual savings through the adoption as a standard of the mechanical pencil for clerical workers were $15,000. This was based on the saving in the annual cost of mechanical pencils as compared with wood-cased pencils, a reduction in the number of pencil sharpeners and in the time lost traveling to and from the pencil sharpeners.

Purchasing and Distribution

In addition to the manufacture of communications facilities for the Bell System, a principal function of the Western Electric is the procurement, distribution, and storing in locations readily available to the telephone companies of the supplies, equipment, and materials required in the operations and maintenance of the Bell System. Standardization that permits centralized purchasing in large quantities has been essential to our success in meeting those requirements.

Starting as far back as 1912 efforts were made to standardize on two sizes of telephone directories, 9 x 11 in. for the large cities, and 6⅛ x 9¼ in. for the smaller cities. As this standardization became effective, Western was able to take over the purchase of directories on a nation-

wide basis. We conservatively estimate that today's expenditures are at least $3,000,000 a year lower by reason of this standardization and centralization. Similarly by standardizing on intervals between issues of the directories printed in one of the larger plants, we were able to distribute the work evenly over a 12-month period, thereby reducing overtime payments to a minimum and obtaining a price reduction amounting to $150,000 annually.

Some 15 years ago the number of kinds of telephone directory binders was reduced from 30 different types to one specific type with varying capacities and sheet sizes. A study of cable record binders resulted in two styles, replacing an estimated 20 styles previously used. A little later 70 different types of binders for intercepting records were replaced by one standard type of binder. A new type of compression binder was standardized to hold items such as Bell System Practices, catalog sheets, etc.

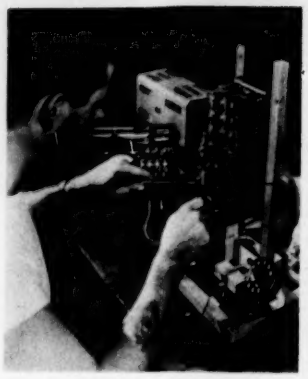
The estimated savings for these items is $250,000 annually.

Competitive bidding brought to light that a price differential of approximately 8.4 percent exists between quantities of 100 vs 500 and up of truck bodies. Purchases have, therefore, been confined in practically all cases to the larger quantity which results in a $40.00 per unit lower price, or when based on purchases of 3,500 as negotiated to date in 1951, shows a price differential of $140,000.

A differential in price of approximately 7 percent was obtained by purchasing 75 units in place of 25 hand trucks. This and the preceding item are examples of quantity buying by virtue of centralized purchasing of standardized items.

As a result of the introduction of a new "breakdown" test set, there was an indicated annual usage of approximately 180,000 45-volt "B" batteries. A specification of our own was prepared with the result that we were able to develop competition and are now paying $1.10 each instead of $1.57 for a commercial product.

We maintain contracts with four suppliers for their standard line of



Inspection of 701 equipment switches in repair shop of Newark Distributing House. Standards have been established for use in the 28 Western Electric Distributing House Repair Shops.

miscellaneous tools. Standardization on the products of these four manufacturers, wherever possible, permits purchases of sufficient size to warrant prices 33⅓ percent lower than otherwise available.

Porcelain strain insulators were purchased to conform with a specification of our own that covered five porcelain insulators which had to be specially marked. An investigation revealed that standard commercial insulators could be used and further that four instead of five sizes would fill the Bell System needs. The annual savings which accrued as a result of this standardization on six manufacturers' commercial products amounted to 30 percent.

Dry gas fire extinguishers were purchased from one supplier. Upon the recommendation of the purchasing department, a new specification was prepared and we were in a position to obtain competitive bids from new approved sources of supply. This resulted in a saving of 12 percent.

Through standardization and unified purchasing of the increasing volume required for the Bell System of paper towels and toilet paper, we are obtaining for the System a better quality at lower cost than buying in smaller quantities by ourselves and the telephone companies would permit.

Shipping Containers

In the shipping room at one plant where corrugated containers were standardized, cleated wooden and fiberboard boxes were eliminated as far as possible and savings of $70,000 annually in labor, material, and transportation were realized.

Distributing House Repair Shop Standards

We use American Standard symbols in preparing detail engineering drawings for piping and wiring installation. We believe that the simplification of drawings obtained through the use of these symbols, which are nationally standardized, has reduced our effort in this work by approximately 15 percent. Standards established for use in the 28 Western Electric Distributing House Repair Shops have enabled Western Electric to benefit through standardization of repair and inspection methods and of testing procedures and equipment, reduced inventories of materials and parts and simplified office work due to standardized cost and stock keeping procedures.

The adoption and use of the standardized practices developed have resulted in an estimated annual savings of approximately $2,000,000.

Elemental Time Standards

The Western Electric Company has developed, over a period of the last 20 years, a work measurement system of predetermined time values applicable to motion elements of manual work. Through laboratory experiments, one set of standard values has been established for use throughout the Company. This work measurement system assures the use of a consistent basis for costs and wage incentive rates, and provides a tool for predetermining the most efficient methods.

Safety Standards

In 1932 a procedure was instituted whereby all safety equipment listed on each individual job layout was consolidated into one safety standard. This standard provides information as to the basic personnel protective equipment and clothing for manufacturing operations so that uniform reference is obtainable on job engineering. Estimated savings to date probably exceed $600,000.

NFPA Releases Proposed Electrical Code Changes

PROPOSED changes for the 1953 National Electrical Code have been released by the National Fire Protection Association, sponsor of the Code. The changes, proposals not recommended, and items remaining on the dockets of the various "Code Making Panels" are detailed and circulated for public comment in NFPA Pamphlet No. 70-PRI. A deadline date of December 1, 1952 has been established for all comments if they are to receive committee consideration prior to the final drafting of the 1953 Code.

Industry, inspection authorities, fire officials, governmental agencies, insurance groups and cooperating national associations participate in developing the Code. Release of this pamphlet affords the general public an opportunity to comment. Merwin M. Brandon of Underwriters' Laboratories is chairman of the NFPA Electrical Correlating Committee; the Secretary is Charles L. Smith, NFPA Electrical Field Engineer. Mr Smith also serves as secretary of the International Association of Electrical Inspectors.

Some of the significant proposed changes and additions follow:

Henceforth it will be required that electrical receptacles be designed so they cannot be used interchangeably in different circuits of different voltage, frequency, or types of current (AC or DC). New rules are proposed to safeguard users of portable equipment and electric clothes driers by more effective grounding means. Liberalization of the use of armored cable in the air voids of cinder block walls is suggested except where subject to excessive moisture or dampness.

An entirely new article is submitted on mineral insulated-metal sheathed cable proposing its use for services, feeders, and branch circuits in both exposed and concealed work, in dry or wet locations, under plaster or embedded in plaster, brick, or other masonry. Necessary changes in the balance of the Code to incorporate this type cable are also detailed. Proposed revisions in the use of new types of non-metallic sheathed cable are specified with comments by the Panel members on the feasibility of the changes.

A revised set of markings for flexible cords and fixture wire is prepared to eliminate the obsolete and include new types, affecting particularly heat-resistant, rubber-covered fixture wire, latex-rubber insulated wires, tinsel cords, heater cords, and range cables. Provisions are proposed to prevent the installation of fixtures and outlet boxes in contact with conducting surfaces of conductive thermal insulation. Gas piping is not to be used as a method of grounding electrical circuits.

The NFPA Code Making Panel dealing with electrical appliances recommends that it be made mandatory for flatirons to be equipped with temperature-limiting devices. This will undoubtedly go far to eliminate fires caused by accidental overheating of such appliances, responsible for many fires in years gone by. Most manufacturers have already incorporated this safeguard on irons. Temperature-limiting means are also to be made mandatory for water heaters, the absence of which is noted as having caused several fires.

A special subcommittee is submitting to the NFPA and the public a proposed new section on fixed electrical space heating equipment in recognition of the growing use of such means of home heating. Another appliance receiving attention is refrigerator motors. The 1953 Code will require that such motors have adequate ventilation to prevent overheating.

Significant changes are proposed for the section of the Code dealing with "hazardous locations." Recognition has been given to positive pressure ventilation arrangements to reduce the area considered hazardous when such ventilation is safeguarded by duplication of equipment or interlocked with the electrical supply. Definitions of hazardous atmospheres are more closely defined to aid in applying the rules. In order to avoid undue restrictions on certain equipment in "Class I, Division 2" locations, such as fixed lighting, instruments, and resistors, there is a proposal that where temperature limitation, based on 80 percent of the accepted ignition temperature of the flammable gas or vapor involved can be secured, general purpose type instead of explosion-proof enclosures may be used. Specific temperature limitations are suggested for surface temperatures of electrical equipment in atmospheres involving Class II or III dust explosion hazards, that is, atmospheres laden with combustible dusts, fibers, or flyings.

Perhaps the most sweeping changes of all are in Article 510 where complete new rules are proposed for commercial garages, residential garages, aircraft hangars, gasoline service stations, bulk plants storing flammable liquids, paint, lacquer, and similar finishing process areas, and where combustible anesthetics are used. The last-mentioned text is drafted based on the NFPA Standards for Hospital Operating Rooms.

Other complete revisions affect Motion Picture Studios, Article 530, and Elevators, Article 620. The latter article also is broadened to take care of dumbwaiters and moving stairways (escalators). A completely new Article 680 is proposed to cover hermetically sealed refrigerating machines.

Emergency lighting systems, as are generally required for hotels, theaters, sports arenas, hospitals, and

(*Continued on page* 356)

How the States Stand on RUBBER MILL SAFETY

THE American Standard Safety Code for Mills and Calenders in the Rubber Industry was the subject of the third analysis by the Bureau of Labor Standards to determine how requirements of state safety codes compare with American Standard safety codes. These analyses are being done in accordance with a recommendation made by the Committee on Engineering of the President's Conference on Industrial Safety. The first was on woodworking machinery (STDZN, March 1951, p. 80); the second was on power presses (STDZN, April 1952, p. 112).

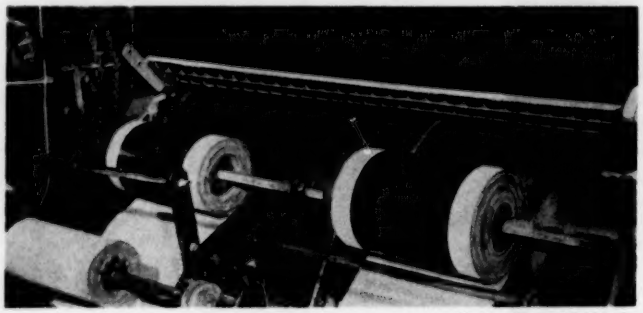
American Standard B28.1-1949 was selected as a criterion by which to determine the adequacy of the existing rubber mill and calender safety codes in the various states because it is recognized as a nationally accepted and impartial standard and therefore a suitable basis for comparison, the Bureau of Labor Standards explains.

The analysis showed that eight states and the District of Columbia have codes or standards that are equivalent to the American Standard; nine states have codes or standards, some of which are similar to the American Standard, some at variance. The great majority of the states (31 in all) have no standards or codes at all for rubber mills and calenders. The Bureau concludes that a definite need exists for the adoption of minimum rubber mill and calender safety codes or standards by those states that do not have them now. "If all of the states would use the ASA Standard [American Standard] as a basis for the drafting and adoption of new codes and the revision of old ones, the now existing variations between the ASA Standard [American Standard] and the State codes would be eliminated," the Bureau declares. "Because of the lack of uniformity in State codes, it is difficult for a manufacturer of rubber mills and calenders to design a machine or safeguard that is acceptable in all states.

The rules in the American Standard most frequently found to be at variance with State codes and standards were on the type of trip control, the location of the trip at front and the location at rear, and the horizontal trip control.

The American Standard Safety Code for Mills and Calenders in the Rubber Industry was developed by a sectional committee under the procedure of the American Standards Association and sponsored by the National Safety Council.

The chart on the opposite page shows the Bureau's analysis of each of the sections in the American Standard safety code state by state.



Firestone Tire and Rubber Co

View of fixed "bite" guard for calenders illustrating the wide steel lattice-type barrier which is rigidly fixed in place across the in-running roll "bite." This barrier is so designed and applied that the operator's fingers cannot come in contact with the "bite."

On substandard mills a barrier-bar safety cradle is recommended. Note that operator cannot reach "bite" without tripping cradle and stopping mill.

United States Rubber Co

LEGEND

- Same as or very similar to ASA Standards
- Less Restrictive than ASA Standard
- More Restrictive than ASA Standard
- No Code or Standard

AMERICAN STANDARD SAFETY CODE FOR MILLS AND CALENDERS IN THE RUBBER INDUSTRY B28.1 - 1949

STATE	TYPE OF RULE	3.1 New Installations	3.2 Existing Installations	3.3 Qualified Employees	3.4 Mill Roll Height	3.5 SAFETY TRIP CONTROL - MILLS: 3.5.1 Type of Trip Control	3.5.2 Location of Trip Pull	3.5.3 Location of Trip Rod	3.6 Center Rods	3.7 Size of Mills	3.8 Front Guards	3.9 Use of Feed Rollers	3.10 SAFETY TRIP CONTROL CALENDERS: 3.10.1 Horizontal Trip Control	3.10.2 Vertical Trip Control	3.11 Bite Guard	3.12 Distance of Travel Test	3.13 STOPPING LIMITS - EXISTING MILLS: 3.13.1 Individual Mill Drives	3.13.2 Group Mill Drives	3.14 STOPPING LIMITS - NEW MILLS: 3.14.1 Individual Mill Drives	3.14.2 Group Mill Drives	3.15 Stopping Limits - Existing Calenders	3.16 Stopping Limits - New Calenders	STATE
ABAMA	Safety Standard																							ALABAMA
IZONA																								ARIZONA
KANSAS	Safety Standard																							ARKANSAS
LIFORNIA	Safety Code																							CALIFORNIA
LORADO	Safety Standard																							COLORADO
NNECTICUT																								CONNECTICUT
LAWARE																								DELAWARE
RIDA																								FLORIDA
RGIA	Safety Standard																							GEORGIA
AHO																								IDAHO
INOIS	Safety Code																							ILLINOIS
IANA	Safety Code																							INDIANA
A																								IOWA
SAS																								KANSAS
TUCKY	Safety Standard																							KENTUCKY
ISIANA																								LOUISIANA
NE																								MAINE
YLAND	Safety Standard																							MARYLAND
SACHUSETTS																								MASSACHUSETTS
HIGAN																								MICHIGAN
NESOTA	Safety Code																							MINNESOTA
SISSIPPI																								MISSISSIPPI
SOURI																								MISSOURI
TANA																								MONTANA
RASKA	Safety Code																							NEBRASKA
ADA																								NEVADA
HAMPSHIRE																								NEW HAMPSHIRE
JERSEY	Safety Code																							NEW JERSEY
MEXICO																								NEW MEXICO
YORK	Safety Code																							NEW YORK
TH CAROLINA																								NORTH CAROLINA
TH DAKOTA																								NORTH DAKOTA
O	Safety Standard																							OHIO
HOMA	Safety Code																							OKLAHOMA
GON																								OREGON
SYLVANIA																								PENNSYLVANIA
E ISLAND	Safety Code																							RHODE ISLAND
H CAROLINA																								SOUTH CAROLINA
H DAKOTA																								SOUTH DAKOTA
ESSEE																								TENNESSEE
S																								TEXAS
																								UTAH
ONT																								VERMONT
INIA																								VIRGINIA
INGTON																								WASHINGTON
VIRGINIA																								WEST VIRGINIA
ONSIN	Safety Code																							WISCONSIN
ING																								WYOMING
OF COL.	Safety Standard																							DIST OF COL.

United States Chamber of Commerce Publishes Its Policy on Standards

(Excerpts from the book *Policy Declarations of the Chamber of Commerce of the United States*, published in July 1952.)

Voluntary Standardization

The Chamber commends the many companies that have intelligently promoted standardization programs in their own operations and that support and participate in the organized development of standards through their trade associations, technical societies and national standards coordinating groups. We urge others to examine the possibilities of improved industrial standards for achieving efficient, safe, and healthful production in the interest of all.

Voluntary standards, developed by industry in cooperation with all interests concerned, have made a major contribution to orderly industrial development without impairing the flexibility of enterprise or the generally desirable diversity of individual products available to the public. Adoption of industrial standards through voluntary efforts free of government control has resulted in increased production at lower cost, providing more and better things for more people.

Although substantial progress has been made in the development of voluntary standards, industry must intensify these efforts in order to achieve the best use of the nation's industrial capacity.

Lower-cost Building

All segments of the building industry, including labor, should give encouragement to the modular-design building program, the purpose of which is to reduce costs by bringing to the individual owner and the builder the economic benefits of better coordination of the design of structures, the manufacturing of materials and equipment, and their assembly on the site.

Building and Other Codes

Building and other codes should be maintained in step with technological progress and obsolete requirements should be eliminated so as to avoid unnecessary costs to owners.

Chambers of commerce are especially well equipped to initiate review of such codes, and to bring together the various interested groups and technical personnel for that purpose. The construction industry also should extend its assistance in modernizing such codes and in supporting their sound administration.

The only objective of building and other codes must be to protect the public life, health and property. They must permit the exercise of individual initiative in improving the design, the materials, the equipment, and the methods of assembly into building and other construction. It is important that legal and other obstacles in the way of the use by communities and states, in their codes, of recognized standards or requirements developed through acceptable industry processes and by qualified agencies be overcome. There is need also for greater standardization and coordination of testing methods so that a determination once made of the acceptability of a new material or method of assembly will be more widely used.

International Industrial Standards

Because industrial standardization provides effective solutions for many serious problems arising in international trade, thereby contributing to better understanding and greater volume of trade, we urge that industry and government cooperate in the establishment of international standards for manufacturing in terminology, specifications and tests.

Thirty-Seventh National Conference on Weights and Measures

The National Conference on Weights and Measures, an organization of state and local weights-and-measures officials, met for its thirty-seventh Annual Conference in Washington, D. C., May 20-23. The Conference is sponsored by the National Bureau of Standards.

A Model Regulation on Package Marking Requirements was tentatively adopted. This regulation is patterned after the Federal Food, Drug, and Cosmetic Act, and is recommended for promulgation by the several states.

The code for pre-packaged ice cream measure containers, tentatively adopted in 1951, was given final approval with amendments which include recommended test procedure. A code for cordage-measuring devices, tentatively adopted in 1950, was also finally approved with minor amendments. Amendments to the codes for liquid-measuring devices and scales were voted by the Conference.

These codes are sections of NBS Handbook 44, *Specifications, Tolerances, and Regulations for Commercial Weighing and Measuring Devices*, which is recommended by NBS for promulgation by the several

states. The Conference was informed that 21 states had officially adopted the material in Handbook 44, and that 5 additional states are now proceeding with such official action.

During the four-day Conference, the delegates heard formal presentations on such topics as farm holding tanks, the measurement of petroleum, grain weighing, and the railway track scale testing program carried on by NBS. Open forum discussions were held on many items of particular interest to the delegates. Among these were tomatoes in cartons, flour weights, standardization of food packages, net-weight marking on packages of tobacco, sale of peat moss, belt-conveyor scales, and testing of vehicle tank meters.

The Conference adopted a resolution recommending that the National Bureau of Standards, in cooperation with the several states, the U. S. Bureau of Public Roads, and the trucking industry, institute an investigation into procedures and results of weighing highway motor vehicles.

Dr A. V. Astin, Director of NBS, was elected President of the Conference.

Terminology Standard a "Must" in Audiology Field

(From *Hearing News*, May 1952)

"The American Standard regarding 'Acoustical Terminology,' sponsored by the Acoustical Society of America, is a must in the library of anyone interested in the field of audiology. Many of the definitions are highly technical and are written in language which is sometimes difficult for the layman to understand, but nevertheless I believe this book will be extremely valuable to the audiologist.

"The definitions have been prepared by a group of individuals who are specialists in each of the branches of the field of acoustics, and have been checked and rechecked by the membership of the Acoustical Society. 'Acoustical Terminology' therefore should be the consensus of the best informed individuals in the field."—Aram Glorig, M.D., Washington, D. C.

This Month's Standards Personality . . .

Dr Harold S. Osborne, one of the pioneers in standardization in this country, was elected president of the International Electrotechnical Commission September 10. Dr Osborne brings to his new responsibility unique ability and experience as chairman and moderator. Those who know him agree that one of his greatest accomplishments has been the ability, time and again, to bring conflicting interests together in an agreement acceptable to both sides.

Dr Osborne (he holds a Doctor of Engineering degree from the Massachusetts Institute of Technology) started his career with the Bell System in 1910 as engineer in the transmission and protection department. He became chief engineer of AT&T in 1943, and held this position until he retired in August of this year after 42 years of service.

Because of his abilities, Dr Osborne was called on to serve as Special Consultant to the Office of the Secretary of War in World War II and as a member of the Telegraph Committee of the War Communications Board, to mention only two of the government agencies with which he worked. He has been active on technical and administrative committees of professional and service organizations—the Engineers Joint Council and the American Society for Engineering Education, as well as the American Institute of Electrical Engineers. He was AIEE president in 1942-1943. Business organizations have called on him, also. He holds directorships in the Research Corporation and the Graphite Metallizing Corporation.

Perhaps his activities in connection with city planning might be considered an avocation. He is past president of the American Society of Planning Officials, director and vice-president of the Regional Plan Association, and member of a number of other planning boards. All this was the result of a number of years spent as chairman of his local Montclair, New Jersey, Town Planning Board.

Dr Osborne showed his interest in the problem of standardization early in the history of the national standards association. Serving as chairman of the Standards Committee of the American Institute of Electrical Engineers from 1923-1926, he was brought into close touch with the work going on through the American Standards Association (then the American Engineering Standards Committee).

He was elected chairman of ASA's Standards Council in 1942 and served until 1945, following this responsible post by election as vice-president of the American Standards Association in 1949.

Dr Osborne has been serving as president of the United States National Committee of IEC, which works closely and is affiliated with the Electrical Standards Committee of ASA.

As president of the International Electrotechnical Commission, Dr Osborne follows in the footsteps of distinguished authorities in the electrical field, the first of whom was Lord Kelvin. This famous British scientist held the post from 1906-1908.

NOTE: IEC became affiliated with the International Organization for Standardization as the latter's Electrical Division in 1947, retaining its technical and financial autonomy. In 1954 the United States National Committee will play host to the Commission on the occasion of its Fiftieth Anniversary.

AMERICAN | BRITISH | CANADIAN

A-B-C CONFERENCE REPORT

THE report of the A-B-C Conference on Unification of Engineering Standards held in New York in June has now been published by the American Society of Mechanical Engineers. It paves the way for another meeting scheduled for the early part of 1953. A permanent organization has been set up following the June conference. Copies of the report can be obtained from the American Standards Association, or from the American Society of Mechanical Engineers at $1.00 each.

On unified screw threads, the discussion covered attachment screws smaller than ¼ in. diameter; machine screws and ISO thread profile; and also acme threads, buttress threads, and instrument threads. In addition, American and British gaging practices were compared. A quantity of parts representing current manufacture will be exchanged among members of the committee in order to evaluate the results of gaging by both the USA and UK methods.

In regard to pipe threads, it was unanimously agreed that it was not possible to make a recommendation for the establishment of a compromise system, but that both the American and the British Standards should remain in force. Therefore, it was decided that any general unification of pipe threads should be dropped as an item of the A-B-C program. Consideration was given also to the establishment of pipe threads with finer pitches than those of the American and British standard threads. It was agreed that if the need for such finer pipe threads should arise in the USA and Canada, consideration should be given to adoption of the British Standard for these finer threads rather than to develop a new standard.

In regard to limits and fits, it developed during discussion that the British were considering adoption of the ISO system converted to inch dimensions and that the Canadians had developed a proposed Canadian Standard. Analysis and comparison of these two proposals showed great similarity in the tolerance tables. Accordingly, it appeared practical to develop an A-B-C proposal covering classes of fit, a range of basic holes, and at least a limited range of shafts. The British and Canadian delegations agreed to continue their cooperation and develop an A-B-C proposal for submittal within six months to the standards bodies in the three countries.

Compressed gas cylinder valve outlet and inlet connections have threads whose A-B-C unification would be helpful. Discussions in the June meetings resulted in a decision that it is not practical at this time to recommend unified standards for threads of this kind. Consequently, this subject was not given further consideration at the June meeting, but it was decided that drawings and tables should be prepared giving complete data necessary for accurate reproduction of gas cylinder valve inlet and outlet connections in each country, such as in the manufacture of adapters. It was further recommended that this approach should be applied first to valve connections for oxygen and carbon dioxide. It was furthermore recommended that a safety system for flush-type cylinder valves adopted by the Compressed Gas Association be adopted as an A-B-C standard.

The committee on Drawings and Drafting Practice reviewed the British Draft Standard on Dimensioning and Tolerancing, and a number of methods of presenting information were given considerable discussion. The Canadian Tentative Standard, B78.1 T-1952, and the proposed Mil Std 8, Part II, Positional Tolerancing, now under consideration for adoption by the US Military Services, were reviewed.

Among the miscellaneous subjects, the question of third vs first angle projection came up for discussion.

Continuing technical committees were set up to provide machinery for carrying forward the programs recommended:

Screw threads—F. H. Rolt (UK); P. R. Brierley (UK); R. H. Field (Canada); F. P. Tisch (US)

Pipe Threads—H. C. Hesse (UK); Dr J. S. Blair (US); R. H. Field (Canada)

Limits and Fits—Z. R. Bliss (US); H. G. Conway (UK); R. S. Eadie (Canada)

Drawings and Drafting Room Practice—R. P. Hoelscher (US); R. R. Houston (UK); Lt Col R. N. Huddleston (Canada)

Screw Threads for Compressed Gas Cylinders—N. R. K. Wheatley (UK); L. Dimitri (Canada); F. R. Fetherston (US)

At the end of the meeting, Stanley J. Harley, chief of the United Kingdom's delegation, commented: "The reports of the chairmen of the five groups are records of accomplishment both positive and negative. To me, some of the negative conclusions are just as important as some of the positive. We know just where we stand. It is no use dissipating our energies where a problem is clearly insoluble. We recognize that if we set down clearly what is the practice in a particular subject in our three countries it will assist others who have not been with us in understanding what they are up against."

A BRITISH SERVICE VIEW OF A-B-C STANDARDIZATION

Here is an article that we believe will interest every reader of STANDARDIZATION. *It describes the purely military phase of A-B-C (American-British-Canadian) standardization. Published by the British Ministry of Supply in its periodical,* "Standardization," *the article discusses the philosophy that has resulted in an active program of cooperation among the Armies, Navies, and Air Forces of the three countries. It also describes in some detail how this cooperation works, and how it is bringing about greater interchangeability of military equipment in the three English-speaking nations.*

SOON after World War II national policy decreed that every endeavor would be made to reach agreement between the United Kingdom, Canada, and the USA over a wide range of subjects involving training and tactics as well as armaments and equipments. Since that time there has been a steady growth of tripartite discussion and exchange of information, the tempo of which is continually increasing. Although to start with there was comparatively little to show for much of the effort put into the project, results are now beginning to appear. There appears, however, to be some lack of knowledge, at any rate in the United Kingdom, of the real objects underlying the whole project, and some lack of appreciation of many of the factors involved.

The objects of standardization as a whole, and particularly between America, Britain, and Canada, are briefly:—

(*a*) To facilitate joint and combined operations by adopting:—
  (i) common doctrines and procedures, and
  (ii) standard or interchangeable equipment and material.
(*b*) To speed progress in defense by the sharing of ideas.

To be effective in achieving these ultimate objects, standardization must also be directed to:—

(*c*) Simplification of design, production, supply, and subsequent maintenance of equipments.
(*d*) Reduction of cost of equipments.
(*e*) Reduction of the work involved in the provision, holding, and transport of stores.
(*f*) Simplification of training.

Another way of stating these objects is that given in the Tripartite documents on the subject, namely:—

> "The objective of standardization is to ensure that in time of necessity there will be no operational material or technical obstacles to full cooperation among the armies of the countries concerned, and to obtain the greatest possible economy in the use of combined resources and effort."

This objective concerns everyone who is responsible for the design, development, production, or inspection of armaments and Service equipments, but how many of these really appreciate the objects of standardization and understand the methods by which these objects can best be achieved? It is, in fact, only too easy to slip into the view that necessity for standardization is merely an additional burden, impeding design and production efforts. Although it is easy to criticize such an attitude, it is well to examine some of the reasons which are likely to foster it. These reasons can be divided into two broad groups:—

(*a*) Difficulties of implementing standardization procedure, and
(*b*) Difficulties of achieving standardization.

As regards (*a*), the whole A-B-C project was originally accorded a high security classification, so that very few people are aware of the underlying reasons behind it. Further, even when the scheme as a whole was made unclassified, the essential factors involved were not given sufficient publicity. The result is that too many people who have to play some part in the over-all standardization effort are not really familiar with existing procedure and the vital reasons behind it. Hence they tend either not to follow the recognized procedure or—worse still—do not attach sufficient weight to the subject in their day-to-day activities.

As regards (*b*), the difficulties of achieving standardization are clearly related, at least in part, to the lack of knowledge just referred to. Nevertheless, there are other matters of great importance. The object of the following remarks is to endeavor to clarify the position and to make clear some of the reasons underlying those A-B-C standards that have already been achieved.

As has probably been realized already, the A-B-C program can be divided broadly into three parts. The first is concerned mainly with tactics and training and is, therefore, not really of much concern to the Ministry of Supply. The second part covers actual armaments and equipments, and the third part includes basic engineering practices and components common to more than one type of armament or equipment.

As regards the second part, the ideal to be aimed at is clearly that all three countries shall use equipment identical down to the last nut and bolt, and manufactured from common drawings. In those instances where this ideal position is not likely to be achieved, the object should be that major sub-assemblies and components and assemblies, at any rate, are interchangeable, although other parts may not be identical. An example of this might be that there

could be three 3-ton trucks — one produced by each country—each having the same engine, gear box, back axle, tires, etc, but differing in other respects. In cases where even this cannot be achieved, attempts are made to ensure that the three countries' equipments shall be tactically interchangeable in the field; that is, that they will have similar performances and leading characteristics.

As regards the third part of the A-B-C program (that dealing with basic engineering practices and common components), it will be seen that the satisfactory achievement of A-B-C standards in this group is an essential before anything better than tactical standardization can be achieved in the equipments coming under the second part of the program.

The above review is broadly true for all three Services, and, in fact, there are three separate A-B-C programs proceeding simultaneously: one between the Navies, another between the Armies, and the third between the Air Forces of the respective countries.

The Naval and Air Force projects are based primarily on training and tactics, and on the ability of one country's ships or aircraft to use another country's ports, airfields, and servicing equipment. The Army program, however, in addition to covering the tactical and supply aspects, is intimately concerned with the question of interchangeability and maintenance of the the three countries' equipments side by side in the field, as well as with the production in one country of equipment decided upon as standard. That part of the program affecting "material" is divided into 10 categories, largely based on the organization of the technical corps of the U.S. Army, as shown below. The "non-material" aspects, including tactical and supply questions, are handled separately.

Category 1—Ordnance General. (This includes Artillery, Small Arms, and "A" and "B" Vehicles).

Category 2—Signals General.

Category 3—Engineer General. (This includes "C" Vehicles).

Category 4—Chemical Warfare.

Category 5—Transportation. (This covers Railway, Road, Air, and Inland Waterway transportation, but does *not* include "A", "B", or "C" Vehicles).

Category 6—Military Medicine and Dental.

Category 7—Quartermaster.

Category 8—General Research.

Category 9—Technical Procedures. (This includes basic engineering practice. Cataloguing, and Components common to two or more of the other Categories).

Category 10—Non-Army Developed Equipment. (That is, equipment used by the Army, but developed by another source).

As indicated, Categories 1-7 and 10 deal with actual equipment or complete stores, while general research comes in Category 8. Components of equipments, as distinct from the equipments themselves, come under Category 9; this category therefore includes items which are used in a variety of equipments which themselves are dealt with in other categories.

Categories 1-7 and 10 thus form the second part of the A-B-C program, while Category 9 represents the third part.

The first step towards producing an equipment or item which is acceptable as a standard to all three countries is to obtain agreed Service requirements (known in the British Army as War Office Specifications, and in the U.S. as Military Characteristics). Without this agreement it is unlikely that even tactical interchangeability in the field can be achieved. The importance of agreed Military Characteristics can, therefore, hardly be over-emphasized nor can the need for "freezing" them when a decision has been reached. Once the Military Characteristics have been agreed, the present practice is for each of the three countries to proceed to develop equipments or solutions to meet them. Sometimes one or even two countries may agree to accept the solution produced by the third country, but this is the exception rather than the rule. Each country, although exchanging information with the others during the whole period of design, development, and testing, continues to produce rival solutions and the users have finally to take their choice. Sometimes this choice is to accept another country's design, but so far the tendency has been for each country to accept its own design, so that the three equipments will not be standardized in the true meaning of the word; they will, in fact, merely be tactically interchangeable and will therefore only satisfy the minimum needs of the standardization program. To reach a higher degree of standardization involves the use by all countries of standard components and parts, and necessitates closer collaboration at all stages of design and development.

An obstacle which sometimes tends to hold up standardization agreements is national pride. It is indeed true to say that the majority of those standards already agreed between the three countries are more closely related to U.S. practice than to British practice, and it is often felt that the national pride of the USA is behind such agreements. It has even been suggested that the Americans' only view of international standardization is that other countries should accept current American practice or designs. It is, of course, obvious that every country favors its own designs and its own solutions of problems, but it is not true to deduce from this that decisions to agree on tripartite standards based on U.S. practice have been reached because no other standards would have been possible. In considering this viewpoint it must, however, be remembered that America can usually devote greater manpower and financial effort to any particular subject or item than can the United Kingdom or Canada. This means that if a project is initiated simultaneously in the three countries, there is every chance that the USA will be able to devote much more effort and money for its development than the other two are able to afford. If, then, equal technical ability is accepted, it follows that America will probably produce a solution more quickly than the other two countries. It then becomes difficult for America to hold back development at a particular stage in order to allow the United Kingdom and Canada to catch up, so that all three solutions can be considered simultaneously on their merits. It is only natural in these circumstances that the Americans tend to take the line that their solution is ready and that the equipment

works; why should the other two countries not accept it as it stands, rather than expend further individual effort?

The only real solution to this state of affairs is that one country only shall be made responsible for the design and development of an equipment to meet requirements that are agreed by all three countries. Such a solution, however, would mean that the country undertaking the development of the equipment would either have to be prepared to produce it in sufficient quantities to meet the needs of all three countries, or would have to supply the other two countries with drawings and full manufacturing information, so that they could produce the item themselves in such a way that it would be identical with that produced by the originating country. In such instances care would have to be taken concerning patent and manufacturing rights.

Since many of the more complicated equipments have to operate in conjunction with other items in the field (e.g., the various equipments involved in a fire control set-up, or a gun and its ammunition), it means that one country would have to undertake the design and development, and the subsequent production, of the completed series of equipments. If only part of the outfit were produced in one country — e.g., if the gun were produced in one country and the ammunition in another—this interpretation of the first solution really also involves the second. That is to say, the originating country must provide the others with full drawings and manufacturing particulars. We therefore come back to the point referred to earlier; namely, that the basis of true standardization and interchangeability must lie on common basic engineering practices such as drawing procedure, screw threads, preferred sizes, limits and fits, etc. Only if these are fully agreed and fully understood in all three countries can the drawings made in one country be used for manufacture in another, with the assurance that all the items produced will in fact be identical from a dimensional and functional point of view.

The above review makes it clear that agreement on basic engineering practices and components (i.e., Category 9 in the Army program) is the very keystone of the tripartite standardization program. Without such agreement the three countries cannot hope to achieve anything better than tactical interchangeability of their equipments in the field, and although this in itself is a very big step, it does nothing at all to assist the common use of radio components, vehicle spares, and other vital supplies.

It will no doubt be of interest to outline the manner in which the ABC Army Standardization program is being carried out:

Category 9

As really forming the basis of the whole program, this is dealt with first.

The work as a whole is guided by the Technical Procedure Committee, meeting in Washington. This committee has representatives of all three countries. All proposals for the A-B-C standardization of basic engineering practices and components, and of subjects of a similar broad nature (e.g., Cataloguing) are considered by this committee, and, if agreed as worthwhile, are incorporated in the "integrated list" with an agreed "scope", and assigned to one of the three countries, who is termed the "monitor" for that item. The duties of the monitor country are to collect all necessary information on the subject from all three countries, and to make firm proposals for an A-B-C Army Standard. To facilitate the collection and evaluation of data, each country (including the Monitor) nominates one authority as the "task agency" for that country, so that the task agency in the monitor country is in a position to obtain the required information from the task agencies in the other two countries. When the Monitor has prepared A-B-C proposals, they are submitted to the Technical Procedures Committee for consideration. When finally agreed by the Technical Procedures Committee a draft A-B-C-Army-Standard is drawn up and is sent for approval to the appropriate authorities in each country, prior to signature by the senior Technical Procedures Committee representative of each country.

In the United Kingdom, wherever possible, Category 9 items are considered on a joint Service basis, through the medium of the Engineering Standards Co-ordinating Committee (or perhaps the Joint Equipment Standardization Committee) of the Ministry of Defense. Further, for such items as drawing office practice, limits and fits, screw threads, and symbols, in which it is clearly essential for Service practice to be in line with industrial usage, the work is done in conjunction with the British Standards Institution. All United Kingdom activities in Category 9 are co-ordinated and directed by the Director, Standardization (Defence), Ministry of Supply, [D.S. (D.), M. of S.] who is also responsible, as the United Kingdom task agency, for some of the individual items.

Categories 1-7 and 10

The work as a whole is guided by the Primary Standardization Office in Washington in which there are representatives of all three countries. As soon as it is apparent, either as a result of research or from a military demand, that there is need for the standardization of a particular requirement for all three countries, it is placed in the appropriate category and an "Integrated List Sheet" is prepared. This sets out the relevant matching projects of the three countries, and gives details of the proposed degree of standardization which is visualized at this stage, or which is necessary to make standardization worth while. The item is then progressed to fruition through six phases, as follows:—

Phase 1—Military Characteristics.
Phase 2—Engineering Design.
Phase 3—Engineering Tests.
Phase 4—User Trials.
Phase 5—Troop Trials.
Phase 6—Classification as adopted type.

Of these, Phases 1, 4, and 5 are the responsibility of the War Office, and Phases 2, 3, and 6 are that of the Ministry of Supply.

Phase 1, the Military Characteristics (in non-A-B-C terminology, the War Office Specification) is, as al-

ready stated, the responsibility of the War Office. When the M.C.'s have been agreed, together with the degree of standardization necessary to make the project worth while, the problem is handed over to the technical staffs concerned; in the United Kingdom, this means to the appropriate Approving Authority in the Ministry of Supply.

Throughout Phases 2 and 3 the closest liaison is maintained by the technical staffs concerned in the three countries, by means of British liaison staffs in the USA and Canada, and by American and Canadian liaison staffs in the United Kingdom. When a country considers that Phase 2 has been completed, concurrence is sought through D.S.(D), M. of S. as follows:—

(*a*) *For United Kingdom Projects*

D.S.(D) requests the U.S. and Canadian liaison officers in this country to obtain their countries' comments.

(*b*) *For. U.S. and Canadian Projects*

The appropriate liaison officer in the U.S. or Canada calls for Phase 2 comments from D.S.(D).

The agreed position for each phase is recorded on the integrated list sheet by the Primary Standardization Office.

Similar action is taken at the conclusion of Phase 3, it being clear that, as design and engineering tests proceed, the degree of standardization which it is possible to achieve should become very much clarified in the process.

Phases 4 and 5 are matters of War Office concern, but Phase 6 is again the responsibility of the Ministry of Supply.

When trials have been concluded and modifications made as required (either as a result of the trials or at the request of one of the Tripartite Countries), the equipment comes up for Phase 6 concurrence. This is negotiated through D.S.(D), as follows:—

(*a*) *For United Kingdom Projects*

D.S.(D) requests the U.S. and Canadian liaison officers in this country to obtain their countries' comments, and to state explicitly the degree of standardization with which they concur.

(*b*) *For U.S. and Canadian Projects*

The appropriate liaison officer in the U.S. or Canada calls for Phase 6 comment from D.S.(D), forwarding such documents as are required for that purpose.

This comment is given on a proforma which is signed jointly on behalf of the M. of S. and the War Office, and which either states explicitly what degree of standardization is concerned with, or gives the reasons why standardization on the item is not agreed.

In the matter of Phase concurrences, all correspondence is channelled through D.W.D. (War Office) and D.S.(D) (Ministry of Supply).

When Phase 6 has been passed, and therefore the degree of standardization originally laid down, and/or subsequently modified, has been reached, it becomes possible to consider the preparation of a formal A-B-C—Army-Standard recording the actual agreement reached. This is arranged in Washington through the Technical Procedures Committee, so that the resulting standard is identical in format with those arising from Category 9. Circulation of this Standard in draft form, and its subsequent signature, is then carried out as already described.

In some cases the regular procedures outlined above are waived, and formal agreement is only sought at some of the phases, but this does not affect the principles involved. Again, in a number of instances, an existing equipment of one country is accepted as providing a stop-gap solution to meet a particular need; such items are known as "short-term" and, in general, A-B-C-Army-Standards are not prepared for them.

Category 8

This covers general research, and as such is mainly used for the various conferences that are arranged to discuss research programs or policies for future requirements. In the past no attempt was made to prepare A-B-C Standards for such matters, and this category as a whole was entirely different in scope and functioning from the remaining categories. The existing Ministry of Supply (Defence) Co-ordinating machinery afforded by D.S.(D) was, however, used for regularizing arrangements made and for recording reports on conferences.

An attempt is now being made to bring items in the research category more into line with those in Categories 1 to 7, by giving them integrated list sheets. The object of this is to ensure that details of decisions reached and actions taken may be recorded in an orderly manner, and not haphazardly as hitherto has been quite frequently the case. There will not, of course, be any progressing of phases for these items, but the coordination will, of course, continue to be arranged through D.S.(D).

As stated earlier, A-B-C standardization is in progress simultaneously in all three Services. Although the description given above relates to the Army program, broadly similar procedures are adopted by the other two Services. For example, Category 9 in the Army program has its counterpart in the Navy program, where it is called Category Z; some of the items actually appear in both categories, although the three Navies recognize Category 9 and accept basic common procedures agreed in the Army-to-Army field of endeavor. This again stresses the need for Joint-Service work on such items whenever possible.

Summing up, then, it will be seen that the whole A-B-C standardization program was conceived to facilitate joint and combined operations by adopting common doctrines and procedures, and standard or interchangeable equipments and material. A further object was to speed progress in defence by the sharing of ideas.

Every effort should be made to achieve these objects. This means, however, considerable effort by all concerned, and also the need to appreciate the real meaning of these objectives in terms of day-to-day design, development, production, and inspection duties. The foregoing description has been written with this point of view in mind.

Standards From Other Countries

Members of the American Standards Association may borrow from the ASA Library copies of any of the following standards recently received from other countries. Orders may also be sent to the country of origin through the ASA office. The titles of the standards are given here in English, but the documents themselves are in the language of the country from which they were received. For the convenience of our readers, the standards are listed under their general UDC classifications.

621.3 Electrical Engineering

Austria — ***ÖNORM***

Galvanic cells and batteries — E 2000

Canada — ***CSA***

Construction and test of special purpose enclosures II, III, IV, and V (Canadian Electrical Code, Part II) — C22.2-No. 94-1952

Specification for oil circuit breakers — C 77-1952

Chile — ***INDITECNOR***

Thermoplastic insulated electric wires — 2.55-3

China — ***CNS***

Specifications for motors and generators — 180 (C13)

Testing of watt-hour meters — 181 (C14)

Finland — ***SFS***

Grounding marks — C.I.19

Electric ovens. Insulating pieces for series connections — C.III.8

France — ***NF***

Symbols used in electrical engineering — X 02-107

Germany — ***DIN***

Graphical symbols used in power distribution and telecommunication drawings — 40710-40712

Fixed capacitors. Roughening of aluminum foil for electrolytic capacitors — 41330

Communication apparatus. Contact location — 41490, B1.2

Clampholder for electric railways — 43155

High-voltage disconnectors 1 to 220 kv and 200 to 6000 amp — 43617

Seven standards for electric temperature measuring apparatus: housing, thermocouples assembly and accessories — 43729, 43732, 43735, 43764, 43765, 43766, 43769

Insulating sleeves for copper or aluminum conductor from 1 to 6 sq-mm cross-section — 47660

Gages for lamp sockets — 49361, B1.4

Lamp base central contact — 49705

Lead-acid batteries for automobiles — 72311, B1.3

Electric hazard sign standard dimensions — 40006

Electric screw thread (Edison type) — 40400, 40401, B1.1, 2

Nickel-Cadmium batteries for handlanterns — 40751

Table showing different types of electric machines — 42950

One type of carbon brushes — 43002

Battery-operated rail-less trucks. Dimensions — 43551

Battery-operated rail-less trucks. Cable shoes and clamps for— — 43569

Electric thermocouples for temperature measuring instruments. List of types, voltages and materials — 43710

Electric thermocouples, wires for— — 43712

Protective sleeves for thermocouples — 43720

Insulating tubes for thermocouples — 43725

Thermopiles. Assembly. Dimensions — 43733

Resistance thermometers and thermopiles — 43770

Insulator for heating element — 44921, B1.1

Sleeve couple of conduits, soldering — 47650

Overhead line branching clamp — 47672, B1.1, 2

Insulators for inside installation — 48102, B1.1, 2

Lighting protective devices — 48801

Two-pole plug, 10 amp 250v — 49403

Fifteen standards for different sizes D-type fuses — 49310-49313, 49315, 49320-49323, 49325, 49360, 49361, 49365, B1.1, 3

Gages for D-type fuses — 49361, B1.1, 3, 49366, B1.1, 2, 3

Electric bulbs, different sizes and bases (screw and bayonet) — 49810, B1.1

Telecommunication. Plastic base for 8-pole lamp — 41509

India — ***IS***

Electric ceiling fans — 374

Three-phase induction motors — 325

Israel — ***SI***

Flexible conduits for electric installation — 49

Portugal — ***IGPAI***

Standard currents — P-23

South Africa — ***SABS***

Electrical equipment safety specification for electric toasters — SV 113-1950

Electrical equipment safety specification for electric irons — SV 114-1950

Standard specification for manually operated enclosed type air-break switches and isolators — 152-1951

Specification for electric toasters — 157-1950

Specification for portable electric appliances for heating liquids — 158-1950

Specification for electric irons — 159-1950

Specification for electric air heaters and radiators — 160-1950

Standard specification for screwed steel conduit and fittings for electrical wiring — 162-1951

Sweden — ***SIS***

Electric lamps; voltage rating — 45-05

Maintenance of transformer insulating oil — 14-1951 E

Lead-covered and paper-insulated cables for voltages over 600 v — 37-1949 E

Electrical measuring instruments — 39-1951

Switzerland — ***SNV***

Insulated metal covered conduits — 24720

United Kingdom — ***BS***

Capacitors for connection to power-frequency systems — 1650:Parts 2 and 3:1952

Cables for vehicles — 1862:1952

Bitumen-base filling compounds for electrical purposes — 1858:1952

Bi-pin lamp-caps and lampholders for tubular fluorescent lamps — 1875:1952

621.64 Devices for Conveyance and Storage of Gases and Liquids in General

Germany — ***DIN***

Polyvinylchloride pipe bends — 8063

Lentil-type flange gasket — 2696

Israel — ***SI***

Nominal bores for water installation components — 59

United Kingdom — ***BS***

Solid drawn aluminum bronze tubes for general purposes — 1867-1952

Flanged steel check valves for the petroleum industry — 1868:1952

Flanged steel globe valves for the petroleum industry — 1873:1952

Solid drawn copper-silicon tubes for general purposes — 1866:1952

621.88 Means of Attachment, Fastenings

Germany — ***DIN***

Half-round head boiler rivets — 123, B1.2, 3

Countersunk-head boiler rivets — 124, B1.2, 3; 302, B1.2-5

Israel — ***SI***

Screw threads, nomenclature — 50.1

Straight Whitworth pipe thread — 50.2

Tapered Whitworth pipe thread — 50.3

United Kingdom — ***BS***

Wood screws — 1210:1952

624 Civil Engineering

Austria — ***ÖNORM***

Symbols for structural elements — B 4300, p. 1

Symbols for welds in steel structures — B4300, p. 3

Unit weight of different building materials — B 4000, t2

France — ***NF***

Wooden door frames — P 23-431

Door openings, dimensions — P 01-004

Germany — ***DIN***

Hanging plaster-and-wire net ceiling — 4121

Standard floor space required by furniture — 18011

Standard door openings — 18100

Space requirements for kitchen ranges — 18016

Window openings 18050
Erection of scaffolding 4420

Italy ***UNI***

General principle of ISA tolerance system applicable to modular constructions (tentative) 3115
Distance between floors in multi-story residential building (tentative) 3140
Shafts for elevators for passengers and freight 3172/3

Mexico ***DGN***

Metal window frames for dwellings B 43-1951

Netherlands ***N***

Incandescent lamps. Types and terminology N-214
Sleeves for steel non-screwed conduits V-1599

Poland ***PN***

Technical stipulations for earth work B-06050
Reinforced concrete window frames, pre-cast B-82010
Wooden doors for balconies B-91071/2
Components of wooden buildings. Technical requirements B-06800

Portugal ***IGPAI***

Highways and airfields, vocabulary of— E-1
Slates E-2
Inert aggregates for concrete E-3

Rumania ***STAS***

Prefabricated wooden barracks 1742
Wooden scaffolding, prefabricated 1829
Wooden structures. Admissible stresses 858
Basic data for calculation of civil and industrial wooden structures 859
Wooden structures. General rules 860
Foundations. General characteristics of soil 1242
Foundations. Determination of moisture content, specific gravity, etc of soil 1913, 1914, 1915

Sweden ***SEN***

Windows and glazed doors. Types and sizes R 60 86 05

629.113 Motor Vehicles, Generalities

Germany ***DIN***

Determination of standard consumption of fuel by motor vehicle 70030
Dynamo, 76.2mm diameter 72417
Starters, 76mm diameter 72457, B1.1, 2
Tail lights for automobiles and motorcycles 72627-72629
Piston rings 73102/3/4
Snap rings for piston pins 73123
Fuel pumps 73356
Disc wheels 74361
Wheel spokes 74371
Jacks, 500-12000 kg capacity 76024

India ***IS***

Fluid for automobile hydraulic brake 317

629.12 Ships and Shipbuilding

France ***NF***

Marine pipes, seamless, hot-rolled J 12-406
Marine pipes, seamless, cold-drawn J 12-410
Marine pipes, nominal diameters J 22-001
Marine pipes, round flanges, dimensions J 22-010
Marine pipes, round flanges for installation through partitions or bridge J 22-011
Marine pipes, flanges type BP and MP-HP J 22-015/6
Marine pipes, rules for the use of plain and tongue-groove flanges J 22-020
Marine pipes, flanged joints J 22-030
Marine pipes, seamless steel pipes, hot-rolled, Wall thickness depending on the fluid J 22-100
Marine pipes, seamless steel pipes, cold-drawn, Wall thickness depending on the fluid J 22-105
Marine pipes. Welded steel pipes. Wall thickness depending on the fluid J 22-110

631 Agriculture in General

France ***NF***

Sprayer joint U 26-002
Dried roots of plants containing rotenone V 03-801
Specifications for dried roots of plants containing rotenone V 38-008

Germany ***DIN***

Iron rammer 11618

64 Domestic Science Housekeeping

France ***NF***

Solid wood furniture. Minimum requirements D 60-301
Veneered wood furniture. Minimum requirements D 60-302

Germany ***DIN***

Wall-hanging lavatories 4495
Lavatories mounted on columns 4496, B1.1, 2
Lavatory basins and details 4497 thru 4500

Mexico ***DGN***

Sanitary enameled cast iron furniture B 41-1951

South Africa ***SABS***

Specification for cleaners for tile, granite, terrazzo and marble floors: soap base 230-1950
Specification for cleaners for highly polished marble surfaces: soap base 231-1950

United Kingdom ***BS***

Cast aluminum saucepans and frying pans for domestic use 1859:1952

661 Chemical Products in the Narrower sense

India ***IS***

Sodium sulfide, technical 297
Alumino-ferric 299
Chromic acid 330

United Kingdom ***BS***

Handling carbon black, part 2, discharge from ships and inland transportation 1714: Part 2:1952

662.6/9 Fuel Industry

China ***CNS***

Bituminous coal, for coke, specification 204(K67)
Bituminous coal for powder, specification 205(K63)

Germany ***DIN***

Liquid fuel. Determination of solid residues 51753
Liquid fuel. Determination of sulfur 51759/60

663 Technical Microbiology. Beverages

Mexico ***DGN***

Canned grapefruit juice F 18-1951

Netherlands ***N***

Physical and chemical test of drinking water 1056, p. II

South Africa ***SABS***

Specification for water for domestic supplies 241-1951

Switzerland ***SNV***

Determination of water conductivity 81508

665 Oils, Fats, Waxes

Chile ***INDITECNOR***

Liquid for automobile brakes 2.86-1

China ***CNS***

Bean oil, specification 192(K55)
Peanut oil, specification 193(K56)
Citronella oil, specification 207(K70)

Finland ***SFS***

Determination of gum content in gasoline M 07-004

Israel ***SI***

Sunflower oil, edible 57

Netherlands ***N***

Determination of density with pycnometer 907
Determination of sulfur content 961

Switzerland ***SNV***

Boiling range of mineral oils 81113
Octane number test of mineral oils 81115

Union of Soviet Socialist Republics ***GOST***

Oil cakes, etc; sampling and testing 5983
Bituminous products; test methods 2400
Green soap 2985
Cans for preserved food 5981
Method of determination of coking properties of mineral oils, heavy fuels, etc 5987

United Kingdom ***BS***

Compressed asbestos jointing for the petroleum industry 1832:1952

666 Glass and Ceramic Industry. Artificial Stone

Denmark ***DS***

Thirty-five standards for concrete and reinforced concrete products 400.0-400.6.3

Israel ***SI***

Portland cement 1
Sampling and compression testing of fresh concrete 26

Mexico ***DGN***

Sanitary vitrified chinaware H 2

Netherlands ***N***

Laboratory glassware. Method of test and classification 936

Spain — ***UNE***

Glass. Terminology of glass defects 43013

Sweden — ***SIS***

Sanitary pottery. Quality and test methods 60 00 72
G-thread (for glass articles), nominal dimensions 71 10 01
G-thread, tolerances 71 10 10
G-thread, gages for screws and nuts 71 10 20
Paint and varnish, sampling 16 00 01
Pigments test for staining strength 16 00 08
Pigments. Red lead 16 04 01

United Kingdom — ***BS***

Salt-glazed ware pipes 65:1952
Glass (vitreous) enamelled salt-glazed fireclay pipes 540:1952

Uruguay — ***UNIT***

Sheet glass for building definition 86
Sheet glass for buildings, classification 87

667.6/8 Paints, Varnishes, Lacquers, etc

Germany — ***DIN***

Standard grey for machinery 1843

Ireland — ***IRISH STANDARDS***

Zinc chromate primers for use on aluminum and light alloys 33:1951

Netherlands — ***N***

Definitions and Specifications of pigments 901

South Africa — ***SABS***

Standard specification for non-reflective olive green camouflage enamel 311-1951
Standard specification for red lead base primers for structural steel 312-1951
Standard specification for wax floor polishes: solvent type, liquid and paste 13-1951
Standard specification for wax floor polishes: emulsion type, liquid and paste 15-1951
Standard specification for cold water distemper for interior use 322-1951

United Kingdom — ***BS***

Red lead for paints and jointing compounds 217:1952
Green oxide of chromium for paints 318:1952
Extenders for paints 1795:1952

Uruguay — ***UNIT***

Chrome-yellow and chrome-orange pigments 85

669 Metallurgy

Belgium — ***NBN***

Determination of total carbon content in iron, steel, cast-iron and alloys, Volumetric method 264
Determination of low carbon content in iron, steel and alloys, Gravimetric method 271

Chile — ***INDITECNOR***

Standard dimensions of round annealed copper wire 2.55-13

China — ***CNS***

Ferro-silicon, test method of 191(K54)
Bronze, test methods 198(K61)
Phosphor Bronze, test method 199(K62)
Gun-metal, test method 200 (K63)
Lead, test method 201(K64)
Zinc, test method 202(K65)
Antimony-lead test method 203(K66)

France — ***NF***

Chemical analysis of ferro and ferro-silicon alloys: vanadium and ferro-vanadium content in presence of chromium A 06-214
Chemical analysis of steels and cast iron. Gravimetric method for determination of carbon content in steels A 06-301
Anodic oxidation of aluminum and its alloys A 91-110
Metal coating by the use of a sprayer and melted metal (Zinc, aluminum, lead) A 91-201

Germany — ***DIN***

Heat treatment of iron and steel 17014
Lead and tin solders 1707

India — ***IS***

Free-cutting brass rods and bars for use in screw machines 319
High strength brass rods, bars, sections 320
Bronze ingots and castings 306

Spain — ***UNE***

Magnet steel 36023

Sweden — ***SIS***

Chemical tests of steel 11 01 05
Tensile test of pressure-vessel steel 11 01 21
Steel 13 30 — Pressure-vessel steel (revised) 14 13 30
Steel 14 30 — Pressure-vessel steel (revised) 14 14 30
Steel 21 12 — Pressure-vessel steel (revised) 14 21 12
Steel 27 26—Tool steel 14 27 26
Summary on Pressure-vessel steel 830
Summary on tool steel 880

United Kingdom — ***BS***

Methods for the analysis of aluminum and aluminum alloys: zinc 1728:Part 4:1952
Methods for the sampling of ferrous metals & metallurgical materials for analysis: iron and steel 1837:Part 1:1952
Methods for the analysis of iron and steel, part 24: Small amounts of chromium in iron and steel (absorptionetric method) 1121:Part 24:1952
Electroplated coatings of tin 1872:1952
Corrugated copper jointing strip for expansion joints 1878:1952
Rolled copper sheet and strip for general purposes 899:1952

679.5 Plastic Industry

Germany — ***DIN***

Plastic materials, hot pressed, hardenable 7707
General testing of soft materials 53400 thru 53403
Bend and impact tests 53452/3
Testing for splitting of laminated pieces 53463

Netherlands — ***N***

Bending and flexion tests of plastics 1509

681 Fine Mechanisms. Clocks and Watches. Musical Instruments

France — ***NF***

Piano mechanism 8994

Germany — ***DIN***

Commercial scales, wood for 1922
Data for commercial and precision scales 1921, B1.1
Scale certificate form 1929
Scale tray 1934, B1.1
Piano keyboard mechanism 8993

69 Building Industry and Trades. Building Construction

Austria — ***ÖNORM***

Specifications for roofing work B 2219
Leinölkitt (Flexible mastic) C 2345

Chile — ***INDITECNOR***

Gypsum. Terminology 2.30-1
Lime, hydrated 2.30-2
Method of testing gypsum and its products 2.30-4

France — ***NF***

Cement, grade CSS (ciment sursulfaté) P 15-313

Germany — ***DIN***

Solid and hollow bricks 105
Water proof lining of tar paper or felt 4031

Ireland — ***IRISH STANDARDS***

Bituminous roofing felt 36:1951

Israel — ***SI***

Method of measurement of building work 43
Cement grade "S" 2
Concrete flooring tiles 6

Netherlands — ***N***

Natural stones, broken and crushed, tests of 1561/2

South Africa — ***SABS***

Structural timber (Model building regulations) 028-1951

Spain — ***UNE***

Cement tiles. Method of test for "congealation" permeability and resistance to bending stress 7033/4

United Kingdom — ***BS CP (Code of Practice)***

Masonry walls ashlared with natural stone or with cast stone 121.201(1951)
Masonry-rubble walls 121.202(1951)
Flues for domestic appliances burning solid fuel 131.101(1951)
Asbestos-cement sheet roof coverings 143.201(1951)
Timber flooring 201(1951)
In-situ flooring 204(1951)
Painting 231(1952)
Domestic electric water-heating installations 324.202(1951)
Staff location systems 327.402(1951)
Small boiler systems using solid fuel 403.101(1952)
Electric lifts for passengers, goods and service 407.101(1951)
Structural softwood, measurement of characteristics affecting strength 1860:1952
Hollow clay building blocks 1190:1951

Uruguay — ***UNIT***

Fine aggregates for Portland cement concrete 84-52

Navy Asks Help in Simplifying Electronics Equipment

Electronics equipment is becoming increasingly complex with resulting decrease in reliability, increase in maintenance time and costs, and difficulty of operation, according to the Navy's Bureau of Ships. Alarmed by the difficulties it is experiencing, the Bureau has issued a call to manufacturers of electronics equipment for help. Directed to the attention of Technical Directors for Research and Engineering, the notice reads: "*Subject: Electronics; project simplification*

"The increasing complexity and resultant increased maintenance and reduced reliability of electronics equipment is a matter of great concern to the Bureau of Ships. Every effort is being made by the Bureau of Ships to simplify the design of electronics equipment. To successfully accomplish our objective, the full cooperation of the engineering staffs of all Bureau of Ships contractors is needed.

"The Bureau of Ships solicits and will welcome proposals from contractors which will result in the production of less complex and more easily maintained equipment. Such proposals for simplification of designs are desired any time during the performance of existing contracts and will be evaluated on a not-to-delay production basis. It is understood that under no circumstances shall changes be invoked in existing contracts unless authorized by formal change under the contracts.

"In order to insure proper evaluation by the Bureau of proposals for simplification of design, it is requested that the proposal completely set forth any existing specification requirements which cannot be fully met. Such proposals should also recommend specification changes which will be necessary to accomplish the proposed simplification."

Send proposals to Bureau of Ships, Electronics Design and Development Division Code 810, Washington 25, D.C.

Book Reviews

American Handbook of Synthetic Textiles, First Edition. By Herbert R. Mauersberger and 22 Collaborators. 1218 pages, 430 tables, charts, and flowsheets. (Book Publishers, Inc, 303 Fifth Avenue, New York 16, N. Y. $10.80)

This is a practical text and reference book for the entire textile and allied industries, such as plastics, rubber, dye, chemical and pulp industries. In a foreword, J. Spencer Love, Chairman of the Board, Burlington Mills Corporation, declares, "This handbook was created to assemble phases of synthetic yarn and fabric manufacture, as well as technical references to all properties and possibilities." Among the technical references is a chapter on the American Standards for Rayon, Acetate, and Mixed Fabrics. The book is especially designed for mill men, technicians, designers, testing people, salesmen, engineers, chemists and students interested in the raw materials, manufacture, properties, processing and testing of synthetic textiles.

The book should take a prominent place in the literature of synthetic textiles in this country and abroad.

Paper and Paperboard, Characteristics, Nomenclature, and Significance of Tests. (American Society for Testing Materials, 1916 Race Street, Philadelphia 3, Pennsylvania. $2.50)

This revised and expanded edition of ASTM's 1944 Monograph on Paper and Paperboard discusses the significance of the more commonly used tests, and defines terms, nomenclature, and properties of paper related to these tests. It is intended to be of service to those who are not thoroughly familiar with the paper field as well as to technologists and other experts working directly in the paper industry.

Sponsored by ASTM Committee D-6 on Paper and Paper Products, the monograph was originally undertaken as a project of Subcommittee II on Significance of Test Methods.

This latest revision was edited by L. C. Reid, Metropolitan Life Insurance Company, past-chairman of ASTM Committee D-6.

The book is divided into four chapters: Introduction; The Action of Water on Paper and Its Significance; Definitions of Terms, Nomenclature, and Properties of Various Classes of Paper and Paperboard; Tests Applied to Paper and Paperboards and Their Significance.

A list of ASTM and TAPPI methods of testing paper and an extensive subject index are included.

Fire Resistance of Shutters for Moving-Stairway Openings. By Nolan D. Mitchell, Edward W. Bender, and James V. Ryan. (National Bureau of Standards Building Materials and Structures Report 129. 9 pp. 10 cents, from Government Printing Office, Washington 25, D. C.)

This report of fire-endurance tests made on flexible rolling shutters for closing moving-stairway openings covers one exploratory and two full-scale tests. Test specimens included the balustrading of a normal installation. The shutters, made of galvanized steel slats moving on rollers, were of the same design in all the tests, and could be operated by hand or by power drive.

"Since moving stairways are used extensively in commercial buildings in which unprotected openings through floors might permit the passage of fire, shutters for closing such openings must be adequately fire-resistant," NBS declares in announcing the publication. "The information contained in this report should interest architects, the building industry, and regulatory bodies concerned with specifications or building code requirements pertaining to moving-stairway installations."

The American Standard Building Exits Code permits the use of automatic self-closing shutters at the top of a moving stairway with one exception. Shutters are not permitted at the top of a stairway moving from the basement floor to the street floor. This is due to the fact that people seeking to escape from the basement to the main floor might be trapped at the top of the stairway if shutters were installed there.

The Engineers' Illustrated Thesaurus. By Herbert Herkimer. (Chemical Publishing Company, 221 Fourth Avenue, New York 3, N. Y. $6.00)

The material included in this one-volume encyclopedia of machine designs is classified in a style similar to that of *Roget's Thesaurus of English Words and Phrases.* In addition to a detailed index, more than 8000 illustrations of mechanical movements, machine parts, and details are classified. "Every conceivable type of machine element is clearly reproduced and identified," the author explains. "Where necessary, an explanation of the method by which it accomplishes its particular function is given. Sketches of related parts are logically grouped for their suggestive value."

Since the book is not intended as a text book of machine design, it emphasizes underlying principles rather than structural details. Typical assembly drawings, examples of American and foreign designs, are given. The material is classified in two main divisions. Part one, Statics, includes: Class I, Fasteners; Class II, Adjusting Devices; Class III, Supports and Structures. Part two, Dynamics, includes: Class IV, Basic Mechanical Movements; Class V, Elevators; Derricks, Cranes, Conveyors; Class VI, Transmission of Liquids and Gases; Class VII, Combustion; Class VIII, Prime Movers; Class IX, Transportation; Class X, Industrial Processes; Class XI, Electrical Appliances; Class XII, Comfort Heating, Cooling and Air Conditioning.

AMERICAN STANDARDS

Status as of September 22, 1952

Standards Council — Approval by Standards Council is final approval as American Standard; usually requires 4 weeks

Board of Review—Acts for Standards Council and gives final approval as American Standard; action usually requires 2 weeks

Correlating Committees — Approve standards to send to Standards Council or Board of Review for final action; approval usually takes 4 weeks

Building

In Board of Review—

Short-Body Cast-Iron Fittings, 3 Inch to 12 Inch, for 250 psi Water Pressure Plus Water Hammer, Specifications for, A21.10
Sponsors: American Gas Association; American Society for Testing Materials; American Water Works Association; New England Water Works Association.

In Correlating Committee—

Seamless Copper Pipe, Standard Sizes, Specifications for, ASTM B42-51; ASA H26.1 (Revision of ASTM B42-49; ASA H26.1-1949)

Seamless Red Brass Pipe, Standard Sizes, Specifications for, ASTM B43-51; ASA H27.1 (Revision of ASTM B43-49; ASA H27.1-1949)

Seamless Copper Water Tube, Specifications for, ASTM B88-51; H23.1 (Revision of ASTM B88-50; ASA H23.1-1949)

Copper-Silicon Alloy Wire for General Purposes, Specifications for, ASTM B99-51; ASA H30.1 (Revision of ASTM B99-49; ASA H30.1-1949)

Copper and Copper-Base Alloy Forging Rods, Bars, and Shapes, Specifications for, ASTM B124-51; ASA H7.1 (Revision of ASTM B124-49; ASA H7.1-1949)

Brass Wire, Specifications for, ASTM B134-51; ASA H32.1 (Revision of ASTM B134-50; ASA H32.1-1951)

Leaded Red Brass (Hardware Bronze) Rods, Bars, and Shapes, Specifications for, ASTM B140-51; ASA H33.1 (Revision of ASTM B140-50; ASA H33.1-1951)
Sponsor: American Society for Testing Materials

Chemicals

In Correlating Committee—

Spirit of Turpentine, Specifications for, ASTM D13-51; ASA K32 (Revision of ASTM D13-34; ASA K32-1937)
Sponsor: American Society for Testing Materials

Consumer

American Standard Approved—

Specifications for Rayon Fabrics, MC 3039, L.22-1952
Sponsor: National Retail Dry Goods Association

Electrical

In Board of Review—

Hard-drawn Aluminum Wire for Electrical Purposes, ASTM B230-50 T; ASA C7.20-1951 (To replace American Standard for Physical and Electrical Properties of Hard-Drawn Aluminum Conductors, C11-1927)
Sponsor: American Society for Testing Materials

In Correlating Committee—

Laminated Thermosetting Products, C59.16 (Revision of C59.16-1951; NEMA 46-118)

Vulcanized Fibre, C59.20 (Revision of C59.20-1949; NEMA VU1-1949)

Specification for Rubber Insulating Tape, ASTM D119-48T; ASA C59.6 (Revision of ASTM D119-38; ASA C59.6-1939)
Sponsor: American Society for Testing Materials.

Method of Test for Dielectric Strength of Insulating Oil of Petroleum Origin, ASTM D877-49; ASA C59.19
Sponsor: American Society for Testing Materials

Electron Tube Bases, Caps, and Terminals, C60.1; RTMA ET 103-B; NEMA No. 500B (Revision of ASA C60.1-1949; RTMA ET 103-A; NEMA No. 500A)

Gage for Electron Tube Bases, ASA C60.7; RTMA ET 106A; NEMA Pub 503A

Rating Values of Interelement Capacitances, C60.8; RTMA ET-114; NEMA Pub 510
Sponsor: Joint Electron Tube Engineering Council

Mechanical

In Board of Review—

Mounting Dimensions of Lubricating and Coolant Pumps for Machine Tools, B5.28
Sponsors: American Society of Mechanical Engineers; Metal Cutting Tool Institute; National Machine Tool Builders Association; Society of Automotive Engineers

In Correlating Committee—

Code for Pressure Piping, B31.1c-1951
Sponsor: American Society of Mechanical Engineers

Preferred Thicknesses for Uncoated Thin Flat Metals (Under 0.250 In.), B32.1 (Revision of B32.1-1941)
Sponsors: American Society of Mechanical Engineers; Society of Automotive Engineers.

Motion Pictures

In Correlating Committee—

Raw Stock Cores for 16-mm Motion Picture Film, PH 22.38 (Revision of Z22.38-1944)

Edge-Numbering 16-mm Motion Picture Film, PH22-83
Sponsor: Society of Motion Picture and Television Engineers

Optics

In Correlating Committee—

Nomenclature for Radiometry and Photometry, Z58.1.1
Sponsor: Optical Society of America

Photography

In Correlating Committee—

Photographic Grade Sodium Sulfite (Na_2SO_3), PH4.275 (Revision of Z38.8.275-1948)

Photographic Grade Sodium Acid Sulfate, Fused ($NaHSO_4$), PH4.105.

Spectral Diffuse Densities of Three Component Subtractive Color Films, PH2.1
Sponsor: Photographic Standards (Correlating) Committee

Standards Submitted—

Method for Determining Performance Characteristics of Focal-Plane Shutters Used in Still Picture Cameras, PH3.2 (To replace WS Z52.65-1946)

Exposure-Time Markings for Focal-Plane Shutters Used in Still Picture Cameras, PH3.3 (To replace proposed WS Z52.64)

Method for Determining Performance Characteristics of Between-the-Lens Shutters Used in Still Picture Cameras, PH3.4 (To replace Z52.63-1946)

Exposure-Time Markings for Between-the-Lens Shutters Used in Still Picture Cameras, PH3.5 (To replace WS Z52.62-1946)

Back Window Location for Roll Film Cameras, PH3.1 (Revision of Z38.4.9-1944)

Tripod Connections for American Cameras (¼ in.-20 thread), PH3.6 (Revision of Z38.4.1-1942)

Tripod Connections for Heavy-Duty or European Cameras (⅜ in.-16 thread adapter for ¼ in.-20 tripod screws), PH3.7 (Revision of Z38.4.2-1942)

Safety

In Correlating Committee—

Safety Code for Mechanical Power-Transmission Apparatus (Revision of B15-1927)
Sponsors: Association of Casualty and Surety Companies, Accident Prevention Department; International Association of Governmental Labor Officials

In Standards Council—

Practice for Industrial Lighting, A11.1 (Revision of A11-1942)
Sponsor: Illuminating Engineering Society

NPA Issues "Production Aid" Pamphlets

Production aids in the form of a number of pamphlets are now being made available by the National Production Authority. Originally written for the Office of Small Business, NPA, by Technical Services, Department of Commerce, the pamphlets offer a non-technical condensation of information gleaned from technical articles, how-to-do pamphlets, specifications and instruction films. They cover:

"Selection, Care and Maintenance of Abrasive Wheels." An exhaustive analysis of factors covering their proper selection, with brief comment on care and maintenance.

"Machining of Stainless Steels." Suggestions for appropriate tool-handling, etc, for 15 different machining operations of these difficult steels.

"Increased Production through Improved Brazing Techniques." Gives advantages of joining components vs one-piece machining, lists improved brazing methods and materials, shows how to select proper materials and suggests ways to apply latest methods.

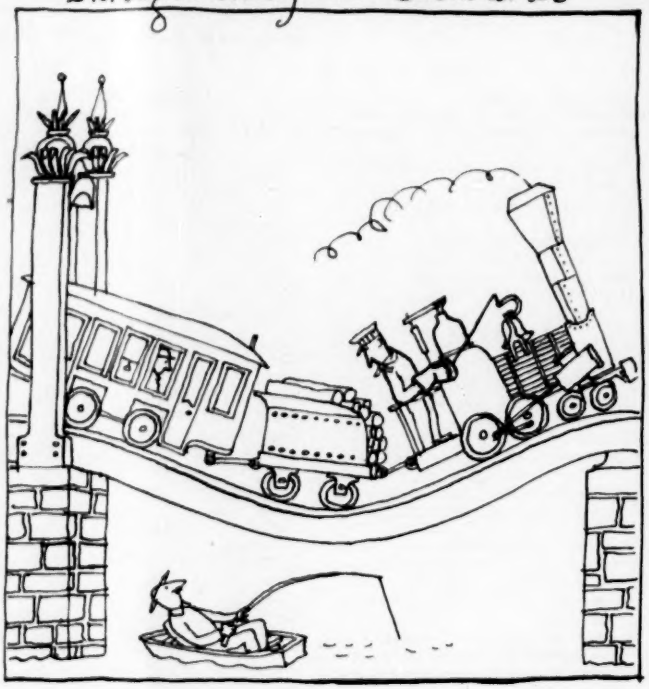
"Motor Care and Maintenance Techniques." Covers check list of procedures to reduce maintenance cost, with suggestions on vibration and heating elimination, on commutator, bearing and cable care and on avoidance of dust troubles.

"Lubrication of Machine Tools." Covers selection, application and storage of lubricants and care of equipment.

"Reclamation of Tools and Workpieces." Reviews benefits as well as repair and instruction methods for reclaiming broken and worn out tools.

"Tool Conservation in Machine Shops." Includes inspection of steels, compiled opinion on grinding to cutting angles, finishing, tool tipping, heat treating and selection of cutting oils.

Through History with Standards



One of a Series by TOM ROSS

One of the problems that used to plague engineers was why an iron structural member would give way under a load that was clearly less than the load that tests had shown it could endure. This problem came to the fore in the first half of the nineteenth century, when it became necessary to establish standards for determining in advance the amount of service that could be expected from the wrought iron bridges that were then beginning to replace masonry bridges.

Thanks to the work of Eaton Hodgkinson and a commission appointed to study the application of iron to railway structures, it was discovered that the ultimate static load is not the only factor to be considered in determining the strength of a structure. It was learned that a load need not be the maximum load, as determined by test, to cause failure—if it were repeated often enough. It was also learned that deterioration of the material was not the determining factor in failure.

Experiments conducted by Wohler established that the range through which a stress is varied has direct correlation with speed of failure. That is, under the practical conditions of use of railway structures, for instance, load variations imposed by passing trains and the hammer effect of steam locomotives were more conducive to failure than would have been the application of a constant load.

The effects just discussed are now widely recognized and are incorporated in standards issued by the Association of American Railroads and the Association of State Highway officials.

Corrections in American Standards

American Standard Specifications for Bearing Mounting Accessories, B3.9-1951

On page 7, Table 1, under the diagram for ball and roller bearing locknuts, the line referring to bearings N-00 to N-06 should be changed to read:

N-00 to N-06, inclusive: 0.002 inch max

American Standards Association would be glad to send a copy of this erratum sheet upon request.

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A corrected edition of the American Standard for 16-Millimeter Motion Picture Projection Reels, PH22.11-1952, has been issued by the American Standards Association.

What's New on American Standard Projects

Safety Code for Elevators, A17—

Sponsors: American Institute of Architects; National Bureau of Standards; American Society of Mechanical Engineers

A revision of the 1937 edition of the American Standard Safety Code for Elevators is now well under way. A number of sections are being distributed for comment. These include a number of new and revised definitions, as well as the following: Sections 100 through 110 of Part I on Hoistways, Hoistway Enclosures and Related Construction for Hand and Power Passenger and Freight Elevators and Dumbwaiters; Section 204 of Part II, on Car Enclosures, Car Doors and Gates and Car Illumination; Section 205 of Part II on Car and Counterweight Safeties of Power Elevators; Section 206 of Part II; Part IV on Power and Hand Sidewalk Elevators; Part VI on Hand Elevators; Part VII on Hand and Power Dumbwaiters.

Copies of the tentative draft can be obtained by writing D. M. Shackelford, The American Society of Mechanical Engineers, 29 West 39th Street, New York 18, N. Y.

Building Code Requirements for Signs and Outdoor Display Structures, A60—

Sponsors: American Municipal Association; Outdoor Advertising Association of America

An editing committee has been set up to prepare a second draft of the proposed revision of the 1949 edition of this American Standard. Comments and suggestions received from a number of sources are being incorporated. A meeting was held in August and it is planned that a second meeting will be called in January, 1953.

Small Tools and Machine Tool Elements, B5—

Sponsors: Metal Cutting Tool Institute; Society of Automotive Engineers; National Machine Tool Builders' Association; American Society of Mechanical Engineers

A proposed revision of American Standard Spindle Noses and Arbors for Milling Machines, B5.18-1943 (Reaffirmed 1949) is now being distributed for letter ballot vote. Those interested may obtain copies of the tentative draft without charge by addressing D. M. Shackelford, Standards Administrator, The American Society of Mechanical Engineers, 29 West 39 Street, New York 18, N. Y.

National Electrical Code, C1—

Sponsor: National Fire Protection Association

Proposed changes for the 1953 edition of the National Electrical Code are being circulated for public comment before consideration by the NFPA Electrical Correlating Committee and submission to ASA for approval. Details of the proposed changes are outlined in the article, "NFPA Releases Proposed Electrical Code Changes," page 339.

Drawings and Drafting Room Practice, Y14—

Sponsors: American Society of Mechanical Engineers; American Society for Engineering Education

In anticipation of the A-B-C meetings held early in June (page 344), the executive committee of this sectional committee requested the American Society of Mechanical Engineers to form a Sponsors Council composed of top level men from industry and government to secure unification of drafting practice. This follows the precedent established by Sectional Committee B1 in dealing with screw threads.

The chairman of Y14 was also empowered to appoint a Task Group to undertake the unification of A-B-C drafting practice.

Acoustical Measurements and Terminology, Z24—

Sponsor: Acoustical Society of America

One of the most active committees at work under the procedure of the American Standards Association at present is Sectional Committee Z24 on Acoustical Measurements and Terminology. Because of the breadth of the field to be covered, it has been necessary to subdivide the work among a larger number of subcommittees, exploratory groups and writing groups. While the entire structure may look complicated, under the able direction of Dr Leo Beranek, chairman, a close coordination of the work has been maintained. As indicative of the interest inherent in the work of this committee for professional groups in the medical, physical, and related scientific fields, for the layman requiring hearing aids, and to the ever-growing groups engaged in the sound production and transmission, a partial listing of the various projects now under way follows:

Exploratory Projects—

- Bio- and Psycho-Acoustic Criteria
- Subjective Tests for Communication Systems
- Absorption Tubes
- Audiometer Earphones
- Calibration of Vibration-Measuring Instruments
- Auxiliary Equipment for Shock and Vibration Measurement
- Vibration-Testing Machines
- Calibrators for Sound Level Meters
- Loudness Contours,
  - Loudness Level
  - Functions and Methods for Objective Measurement of Loudness
- Testing of Hearing Protectors
- Testing of Bells
- Revision of Z24.4-1949 and Z24.8-1949
- Revision of Z24.9-1949
- Ear Plug Testing

Writing Projects—

- Narrow Band Frequency Analyzers
- Secondary Calibration of Microphones
- General Terminology for Vibration and Shock
- Laboratory and Field Air-Borne Sound
- High Intensity Shock-Testing Machine
- Shock-Testing Machine for Electronic Components
- Medium Impact Shock-Testing Machine
- Shock-Testing Machines for Industrial Instruments
- Instruments for Measurement of Shock and Vibration
- Sound Level Meters
- Underwater Acoustical Terminology
- Calibration of Underwater Transducers

Many of these projects came up for discussion as to present status and future development at the May 7, 1952 meeting held in New York during the meeting of the Acoustical Society. The American Standards

developed by Sectional Committee Z24 and now available at ASA headquarters are as follows:

Acoustical Terminology, Z24.1-1951	$1.50
Noise Measurements, Z24.2-1942	$.50
Sound Level Meters for Measurement of Noise and Other Sounds	$.50
Method for the Pressure Calibration of Laboratory Standard Pressure Microphones, Z24.4-1949	$.75
Audiometers for General Diagnostic Purposes, Z24.5-1951	$.50
Test Code for Apparatus Noise Measurement, Z24.7-1950	$.50
Specification for Laboratory Standard Pressure Microphones, Z24.8-1949	$.50
Method for the Coupler Calibration of Earphones, Z24.9-1949	$.75

Another meeting of this committee is tentatively scheduled for October or November in San Diego, California, during the Fall meeting of the Acoustical Society of America.

Allowable Concentrations of Toxic Dusts and Gases, Z37—

A draft standard specifying the maximum concentration of radium dust or radon gas that can be permitted in the atmosphere of work places for the protection of the health of workers has been completed by the Subcommittee on Radium. The proposed standard also prescribed the maximum permissible exposure to external beta and gamma radiation from the decay products of radium and radon, and maximum permissible quantity of accumulated radioactivity in the body of the individual employee. It does not, however, apply to the mining of radioactive ores. The draft has been submitted to the sectional committee for consideration.

Dr Leonard Greenburg, Division of Industrial Hygiene of the New York State Department of Labor, is chairman of the subcommittee.

Prevention or Control of Hazards to Children—

This new project has been initiated by the Safety Code Correlating Committee with the following scope:

"Standards for the prevention or control of hazards to children which may result in physical trauma or poisoning."

The American Academy of Pediatrics is being invited to serve as sponsor.

NFPA Code Changes

(*Continued from page* 339)

similar institutions also receive a complete new treatment inasmuch as Article 700 of the 1951 Code has been completely revised. Requirements for emergency power, as needed for essential refrigeration, breathing apparatus, power for hospital operating rooms, fire pumps, and industrial processes where current interruption would have serious consequences, are added to the previous rules. They had covered only lighting. The new Code proposals feature *how* emergency systems should be installed, leaving to other NFPA Standards the specifications as to *where* and *when* such systems are needed. The NFPA Building Exits Code is the principal standard defining the latter requirements.

A general revision of Article 710, applying to circuits and equipment operating at more than 600 volts between conductors, is also proposed. This particular section needed clarification to indicate clearly its intent. Article 725 is broadened to include low voltage circuits not used for signal or remote control circuits to which previously this Article was restricted. Article 810 has had its title changed to indicate clearly its application to television as well as radio equipment and important revisions are made to help installers on the installation of antennas and to detail methods of grounding.

Copies of NFPA Pamphlet No. 70-PRI are available by addressing NFPA Publication Services, 60 Batterymarch Street, Boston 10, Mass. Price is $2.00 per copy.

Standard Methods of Sampling Coal and Oil

Examples of application of standard methods to sampling of coal and oil are given in two papers by H. C. Hamaker. Standard methods of the American Society for Testing Materials and the British Standards Institution are referred to in descriptions of methods employed for shiploads of coal arriving at Rotterdam, and also for sampling coal at the Dutch mines.

The papers appear in the United Nations' *Report to the Statistical Commission of the Fifth Session of the Sub-Commission on Statistical Sampling* (E/CN.3/Sub 1/47).

In "Sampling of Oil and Related Techniques in Use by the Shell Oil Company," Dr Hamaker says:

"The Shell Company is sampling and testing shiploads or tankloads of oil in its laboratories all over the world. Methods for comparing test results, developed on a statistical basis, have been laid down in a loose-leaf manual entitled: *Shell Method Series* (SMS). The main features of the methods adopted are:

"(i) Standardized methods of sampling, analysis and measurements.

"(ii) Recognition of the fact that even with a standardized method the variation among measurements in different laboratories is generally larger than the variation within a laboratory. This has led to the definitions of the 'repeatability' and the 'reproducibility' which are some sort of three limits to be used for comparing measurement within and between laboratories respectively.

"(iii) Fixed rules of conduct when measurements do not tally, rules for rejecting outlying observations included.

"The setting up and maintaining of such methods clearly require:

"(*a*) Standardization of methods;

"(*b*) A systematic research by some central organization in order to fix the values of the repeatability and reproducibility;

"(*c*) A regular check by the same central institute in order to control the reliability and constancy of the standard practices.

"For a large concern like the Shell Company it is evidently worthwhile to set up a central department in charge of standardization along these lines. To reach agreement among a number of smaller concerns spread out over different countries a recognized and neutral research institute would be required."

International Work on Illumination

At the recent Annual Meeting of the U. S. National Committee of the International Commission on Illumination, recommendations tentatively adopted at the Twelfth Session of the Commission in Stockholm, Sweden, on June 26 to July 7, 1951, were, with few exceptions, confirmed. In attendance at the Stockholm sessions were 450 delegates from 22 countries. The United States was represented by 18 delegates, among whom were L. E. Barbrow, F. C. Breckenridge, and D. B. Judd of the National Bureau of Standards; and W. C. Wagner, then Chairman of the ASA Standards Council.

Most important among the confirmed recommendations were: (1) The adoption of a relative luminosity curve for the dark-adapted human eye near the threshold in extra-foveal vision. (2) A new definition of standard source *A* which fixes the spectral energy distribution of this source regardless of how the constant C_2 of Planck may be changed. (3) A procedure for comparing the performance of European and American automobile headlights preliminary to proposing a world agreement based on technical requirements for the passing beam of headlight. (4) International definitions of five signal colors (red, yellow, green, blue, and white), suitable for general signal purposes and additional definitions for red, green, and blue lights designed to assure a high certainty of recognition of the signal color.

Studies have been started that are expected to lead at the next meeting in 1955 to the adoption of a more accurate standard observer and relative luminosity curve for the light-adapted human eye and to a coordinate system for colorimetry which will express color differences more faithfully. Extensive studies were also planned to determine the color-rendering properties of fluorescent lamps and to develop an international method for specifying such properties.

Dr Judd presented a report on colorimetry which included recommendations for changes in the luminosity curve of the light-adapted eye as well as a resumé of methods for specifying the color-rendering properties of light sources. Mr Breckenridge represented the United States in the development of recommendations for the colors of light signals and in the study of the required characteristics of approach-light systems. Secretary of the U. S. delegation was Mr Barbrow, who also served as a member of the Executive Committee of the Commission which formulated the policies that will guide the Commission until its next session in Switzerland during 1955.

(From *The Technical News Bulletin* of the National Bureau of Standards, February 1952.)

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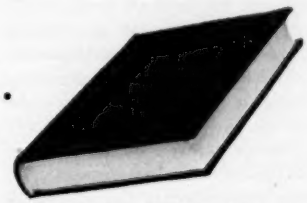

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News Briefs

• • **The American Society for Testing Materials,** through its President, Harold L. Maxwell, announced recently the election of Robert J. Painter as Executive Secretary and of Raymond E. Hess as Associate Executive Secretary. The promotions were made by the ASTM Board of Directors at its meeting on September 16.

Mr Painter most recently has been Treasurer and Assistant Secretary of this national technical society. He is a graduate with a degree of Civil Engineer from Rensselaer Polytechnic Institute. Mr Hess has been Technical Secretary and Editor for many years. He is a Civil Engineering graduate from the University of Pennsylvania.

At its New York meeting in June this year the Society commemorated 50 years of operations in materials research and standards work. ASTM was one of the five engineering "Founder" societies that helped establish the American Engineering Standards Committee (now the ASA).

Always active in ASA affairs, ASTM submits large numbers of standards each year for approval as American Standards.

• • **On June 9 and 10, Henry Lamb,** Safety Engineer of the American Standards Association, was one of the speakers at the Fifth Annual North Dakota Safety Conference. Mr Lamb reported on President Truman's eight-point program and stressed the need for eliminating conflicts between State codes as a means to achieving built-in safety in the manufacture of machinery.

Mr Lamb also participated in the discussions of the industrial and the mine sectional meetings.

Some 175 persons, including delegates from 24 cities and towns in North Dakota, and visitors from 11 states, attended the meetings. Both labor and industry were well represented at the conference and at the preliminary hearing on a proposed basic safety manual prepared by the safety department of the Workmen's Compensation Bureau which followed the conference, according to the Conference report.

• • **Industrial Photography,** a new magazine which will issue its first copies in October, has already lined up information on standards as one of the subjects to be given special consideration. The editor announces that he plans to focus attention on the "various means by which the photographer may use his skill and training to provide accurate visual information as a tool for management." In addition to feature articles concerning photography as a tool of the businessman, each issue will feature a technical article dealing with some phase of photography of particular importance to the industrial user. Benjamin Melnitsky, author of many articles on various phases of standardization and of the book, *Management of Industrial Inventory*, is Associate Editor.

• • **Mr John Ryan,** CBE, MC, vice-chairman of the Metal Box Company, has been named chairman of the General Council of the British Standards Institution. He succeeds Sir Roger Duncalfe, who had served as chairman for more than the regular three-year term. In recognition of the hard work and encouragement given to the Institution by Sir Roger during its recent rapid growth in activities and responsibilities, he has been elected unanimously as BSI Vice-President.

Mr Ryan's principal technological interest in BSI's work is in the field of packaging. He is also an expert in company finance and administration, and for the past four years has been chairman of the BSI Finance Committee.

• • **Revised editions of two 16-mm films** on motion study have been released by the Bureau of Audio-Visual Instruction of the State University of Iowa, Iowa City, Iowa. The two films are "Motion Study Principles" and "Motion Study Applications."

The films were originally produced for use by Professor Ralph M. Barnes in connection with his courses in Industrial Engineering and Management at the University. They have had such wide acceptance that a revised edition has been prepared. The entire film has been retaken and the new prints are now available on a rental or sales basis. Details are as follows:

U-919, Motion Study Principles (Revised), 990 ft, showing time 28 minutes. Rental $4.00 for one or two days. Sale price $75.00. The film consists of three parts:

(A) *The assembly of three washers on to a bolt.* By applying nine principles of motion economy an improved method was developed which enabled the operator to increase her output 53 percent. (B) *Refrigerator door knob assembly.* The use of a foot-operated fixture made this job so much easier that output was automatically increased 143 percent. (C) *Folding packing papers.* Elimination of abrupt changes in direction of the hand in folding sheets of paper, together with some other changes in method, enabled the operator to increase her output 42 percent.

U-979, Motion Study Applications (Revised), 660 ft, showing time 18 minutes. Rental $4.00 for one or two days. Sale price $75.00. This film defines the most common hand motions and shows how an understanding of this classification of motions together with a knowledge of motion study principles enables one to develop better and easier ways to work. The following applications are presented:

(A) *Pin board assembly.* Simultaneous symmetrical hand motions decreased the time to perform this task 39 percent. (B) *Folding cartons.* A simple wood fixture made this job so much easier that the operator

doubled his output. (C) *Filling glass bottles with capsules.* Operator's output was increased 485 percent. (D) *Inserting papers in mailing envelopes.* A simple fixture and the use of balanced motions increased output 114 percent.

• • **The Standards Engineers Society** decided at its Spring meeting, June 5, in New York City, to take positive steps to set up regional branches in New York, Philadelphia, and other areas. A constitution was adopted, and machinery for election of officers has been set in motion.

The next meeting is November 10th at the Engineers Club, Philadelphia.

J. A. Gavin, Plant Engineer, Ternstedt Division, General Motors Corporation, was the speaker at the June meeting. He traced the history of standards in General Motors back to 1911 and told the Society that since 1944 "the gathering of information toward writing new standards or revising old standards for the automotive industry has been a Joint Industry Conference project." Taking "Electrical and Hydraulic Standards" as his subject, he explained how and why the Joint Industry Conference was organized and how it operates. He also explained why the automotive industry believes its standards for electrical equipment on machine tools increase the efficiency and safety of the machines.

Arthur L. Abbott, member of the staff of the National Electrical Manufacturers Association since 1931, died July 26 in his 80th year after a brief illness. Mr Abbott, who served as secretary of Sectional Committee C73 on Attachment Plugs and Receptacles, was also well known in standardization circles as author of the National Electrical Code Handbook. He contributed many articles to leading technical publications. He was the first man to develop standards for electrical estimating which are now widely used in the electrical construction industry, and was author of the Electrical Contractors Estimating Manual. He was Fellow and life member of the American Institute of Electrical Engineers.

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• • **The Proceedings of the Third National Standardization Conference** held in Chicago September 8-10 in connection with the Centennial of Engineering are being prepared for publication. Everyone who registered for the entire Conference will receive a copy as a part of the service included in the registration fee. However, it was erroneously stated in STANDARDIZATION, August, page 248, that a copy would be sent to "all those registered." This service extends only to those who registered for the entire Conference. An announcement giving price, size of the book, and outlining the contents will be published in our November issue.

• • **Members of the Company Member Conference** who visited the Norfolk Naval Base May 21 and 22 were impressed with the cataloging system for ships' parts as explained in a film shown during their visit to the General Supply Depot, U.S. Naval Supply Center. The Navy has now released this film for loan to ASA members on a temporary basis. Requests for the film on "Ship's Parts Cataloging" should be directed to the Bureau of Supplies and Accounts, Code S-3, Navy Department, Washington 25, D.C. Requests should indicate how the film will be used, and the length of time it will be needed. There is one restriction—the film has not been cleared for television showing.

• • **The National Bureau of Standards** has recently compiled a set of molecular microwave spectra tables to be published as an NBS circular. The computation and tabulation has been conducted by P. Kisliuk and C. H. Townes (Columbia University and NBS) in cooperation with the NBS Microwave Standards Laboratory. The tabulation comprises 99 molecules from the simpler diatomic molecules to more complex combinations such as chlorotrimethyl methane (C_4H_9Cl). About 1800 microwave absorption lines are included that range in frequency from 2,000 to 150,000 mc.

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